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FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE

JOHN L. FARLEY, DIRECTOR

COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

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Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

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CONTENTS

COVER: These ten trawlers were part of an over-all shipbuilding program designed to re-establish Korea's war-shattered fishing industry, on which that country depends for some 80 percent of its protein. The photograph shows the ten trawlers shortly after they were launched at the shipyard in Kowloon, Hong Kong, early in 1955. Originally purchased by UNKRA for the Korean fishing industry, these vessels recently were purchased by a new private Korean fishery firm (see p. 79 of this issue).

	Page
Georges Bank Haddock Fishery--Changes in Scrod Abundance in Recent Years, by John R. Clark	1
Bleeding and Heat Death in the Southern Oyster, by Milton Fingerman and Laurence D. Fairbanks	4
New Diving Sled, by Reidar F. Sand	6
RESEARCH IN SERVICE LABORATORIES:	8
Experimental Fish Meal Dryer	8
Experimental Bulk Ocean Shipments of Alaska Herring Meal	8
Processing Studies on Menhaden Meal	9
Converting Fish Scales into Animal Food	10
Salmon Waste as Bait	11
Breaded Shrimp Interim Federal Specification	11
TRENDS AND DEVELOPMENTS:	12
California:	
Abundance Determination of Sardines and Anchovies in Central California (Airplane Spotting Flight 56-6)	12
First Silver Salmon Taken in Sacramento River	13
Albacore Tuna Tagged by M/V N. B. Scofield (Cruise 56-S-3)	13
Clipper Tags Yellowfin and Skipjack Tuna (M/V Lucky Star, Cruise 56-C-3)	14
Cans--Shipments for Fishery Products, January-June 1956	14
Federal Purchases of Fishery Products:	
Fresh and Frozen Fishery Products Purchased by the Department of Defense, July 1956	15
Canned Fishery Products Purchased Through Quartermaster Market Centers, April-June 1956	15
Films	16
Fish Hatcheries	17
Frozen Foods Temperature Tolerance	17
Fur Seals:	
Service Begins Harvesting Female Seals of Pribilof Herd	18
Great Lakes Fishery Investigations:	
Walleye Abundance in Saginaw Bay During Summer Studied by M/V Cisco (Cruise 3)	19
TRENDS AND DEVELOPMENTS (Contd.):	
Chub Population Studies in Lake Huron by M/V Cisco (Cruise 4)	20
Ionizing Radiation Center Planned	21
Market Outlook for Fishery Products	22
National School-Lunch Program	23
Maine:	
New Sardine Film	24
North Atlantic Fisheries Exploration and Gear Research:	
Different Types of Trawl Nets Tested (M/V Delaware, Cruise 23 and M/V Albatross III Cruise 79)	24
Midwater Trawling by M/V Delaware from Georges Bank to St. Pierre Bank Yields No Fish (Cruise 24 and 25)	27
North Atlantic Fisheries Investigations:	
Biologists Tag First Ocean Perch	28
Materials for Groundfish Food Habits Study Collected by M/V Albatross III (Cruise 80)	28
North Atlantic Herring Research:	
Coastal Waters of Eastern Gulf of Maine Explored for Herring by M/V Metacomet (Cruise 5)	29
North Pacific Exploratory Fishery Program:	
Albacore Tuna and Salmon Distribution in Offshore Waters Studied by John N. Cobb (Cruise 28)	30
Oysters:	
Summer 1956 Set in Chesapeake Bay Area	31
South Atlantic Exploratory Fishery Program:	
Round-the-Clock Trawling by M/V Combat Yields Excellent Catches of Red Shrimp (Cruise 4)	32
Experimental Shrimp Trawling in Key West-Tortugas Area by George M. Bowers (Cruise 6)	33

Contents Continued Page 120

COMMERCIAL FISHERIES REVIEW

October 1956 Washington 25, D.C. Vol.18, No.10

GEORGES BANK HADDOCK FISHERY -- CHANGES IN SCROD ABUNDANCE IN RECENT YEARS

By John R. Clark*

Georges Bank (fig. 1) has become a scrod[1/] haddock fishing ground during recent years due to an increased abundance of young haddock. Annual landings of scrod exceeded landings of large haddock in the Georges Bank fishery (fig. 2) for the first time in 1950, and have continued to do so every year since. Figure 3 shows how scrod landings have increased in relative importance.

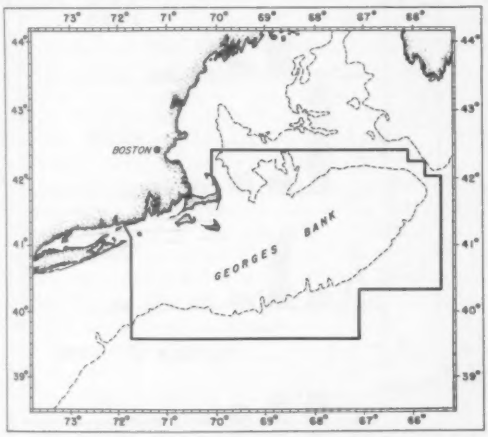

Fig. 1 - The area referred to as Georges Bank in this report.

Examination of the age composition of the landings revealed that the predominance of small scrod in the 1950 landings was due to an exceptional abundance of two-year-old haddock. [2/] These scrod were members of the 1948 year-class which proved to be stronger than any brood previously recorded. A considerable reduction in the size of fish landed due to large catches of small scrod caused a great amount of concern in the fishing industry.

In the 1951 fishery the 1948 year-class continued to dominate the landings and provided a great abundance of large scrod. [3/] The fish of the 1948 brood were three years old in 1951 and having added another year's growth by then were of a more desirable size.

Scrod have continued to dominate the fishery since 1951 due to a series of strong-year classes in alternate years, yielding large catches first of two-year-olds, then of three-year-olds. This phenomenon is demonstrated in figure 4, which shows the number of each age caught during an average day's fishing. The dominance of the 1948 year-class as two-year-olds in 1950 and as three-year-olds in 1951 is evident. The pattern is repeated for the 1950 and 1952 year-classes which dominated

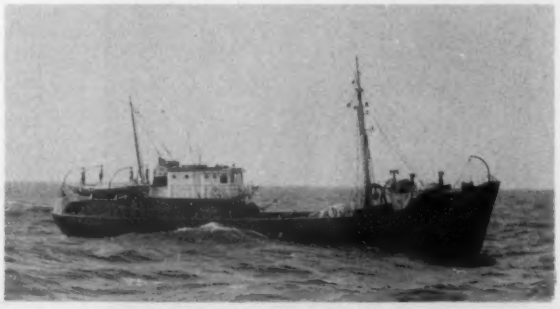

Fig. 2 - Typical otter trawler employed in the Georges Bank Fishery

* Fishery Research Biologist, North Atlantic Fishery Investigations, Branch of Fishery Biology, U. S. Fish and Wildlife Service, Woods Hole, Mass.

1/ Haddock weighing $1\frac{1}{2}$-$2\frac{1}{2}$ pounds are scrod.
2/ Commercial Fisheries Review, June 1951.
3/ Commercial Fisheries Review, August 1952.

the landings as two-year-olds in 1952 and 1954 and as three-year-olds in 1953 and 1955, respectively. The catch per day of two- and three-year-olds from the 1948,

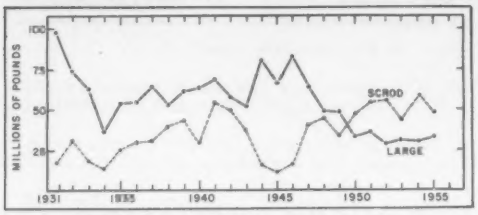

Fig. 3 - Landings of large and scrod haddock from Georges Bank.

1950, and 1952 year-classes was considerably higher than from the average year-class of the base period, 1931-1948. The catch per day of four-year-old and older fish was somewhat lower during 1950-1955. From the age of four years on, haddock move rapidly into the "large" category. As their abundance is being reduced at the rate of about 50 percent each year by the present intensive fishery, the yield of even the most abundant year-classes, such as the 1948, 1950, and 1952 broods, diminishes rapidly from four years of age on.

Whether scrod will continue to dominate the landings depends on the abundance of two-

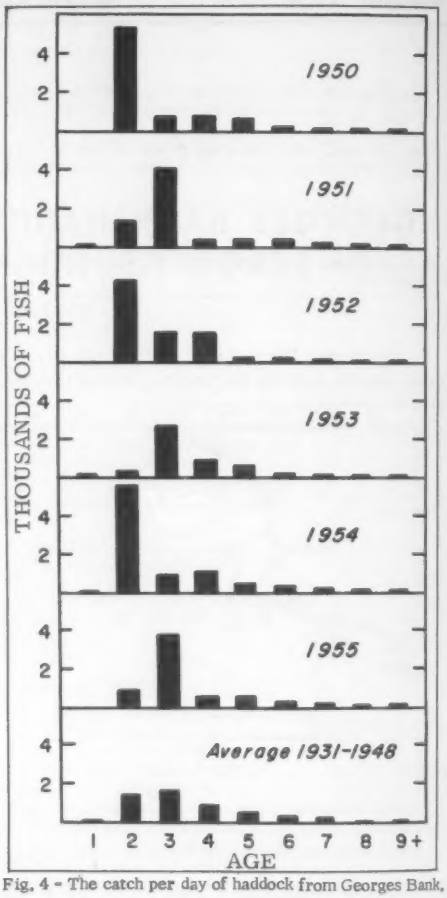

Fig. 4 - The catch per day of haddock from Georges Bank.

Fig. 5 - Biologist measuring discarded haddock aboard Boston trawler.

year-old haddock in the future. Because the 1953 year-class showed up so poorly as two-year-olds last year, we expect few three-year-olds in 1956 landings. Preliminary examination of 1956 records bears out this belief. The success of the 1954 brood cannot be accurately determined until next year, after the complete 1956 records have been analyzed. An accurate measurement of the 1955 year-class cannot be obtained until 1958. It is, however, possible to obtain an indication of the strength of year-classes from data on the quantity of one-year-old fish discarded in the fall of the year, a measure of which is obtained by Service biologists

aboard Boston trawlers (fig. 5). We are also able to judge the success of a year-class from catches of young of the year and one-year-old haddock taken in special small-mesh nets on the Service's research vessel Albatross III (fig. 6).

If our observations on abundance of young fish are correct, the abundance of scrod will be low during this current year. In the 1956 landings the quantity of large haddock landed is thus expected to surpass the quantity of scrod for the first time since 1949. It is likely that the scarcity of scrod will continue through 1957. More limited observations on the occurrence of the 1955 year-class indicate that it will be somewhat stronger than the brood of 1954 but not as strong as those of 1948, 1950, and 1952. Thus the scarcity of scrod could continue through 1958.

Fig. 6 - Hauling trawl aboard the U. S. Fish and Wildlife Services's research vessel Albatross III on a small haddock survey.

Although the large fluctuations in abundance of year-classes cannot be controlled by man, we can make the best use of what nature has provided. To this end the mesh regulation in effect on Georges Bank will increase the yield from each year-class as it passes through the fishery, but it cannot raise the original abundance of the brood. With the fishery so dependent upon scrod, a series of unproductive year-classes could cause a reduction in landings in spite of the regulation. The use of large mesh will, however, reduce the possibility of such a decline becoming serious.

SPINY LOBSTER ALONG THE FLORIDA KEYS TRAVELS

Spiny lobsters were tagged by scientists from the Miami Marine Laboratory at various locations along the coast from Hillsborough to Key West. Over 5,000 tagged individuals were released from 1945 to 1949 and of these 251 were recovered. Some of the longest distances from point of release to point of reported recovery were from Pacific Light to near Key West, about 120 miles south, and from Upper Matecumbe to Hillsborough Light, about 130 miles north. In 1947 one lobster tagged at Cudjoe Key was recovered 123 days later near Loggerhead Key, a distance of 100 miles. The other long migrations took over a year.

Most recoveries were from less than 6 miles from the point of release after being free an average of 71.5 days.

Seasonal movements between inshore and offshore waters have been associated with the breeding habits and changes in water temperature.

During the months of February to April, the lobsters tend to collect in certain inshore waters while mating. From April to June the females move into deeper water, where the eggs are laid, and return again to the inshore waters during July and August. Spiny lobsters also tend to move offshore during the cold months of December and January.

--Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.

BLEEDING AND HEAT DEATH IN THE SOUTHERN OYSTER [1/]

By Milton Fingerman* and Laurence D. Fairbanks*

In a previous investigation (Fingerman and Fairbanks 1956) the authors postulated that (1) the oyster (Crassostrea virginica) has very little ability to control the volume of its body fluids and (2) one of its responses to physiological stress is a generalized bleeding, loss of body fluids. The experiments described below were designed in order to test this hypothesis by determining if application of heat evokes the bleeding reaction.

Fig. 1 - Examining oysters under a microscope. In the rear are holding tanks with oysters.

In the first series of experiments oysters were heated at different rates. The number of survivors and weight changes were noted. The slower the rate of temperature increase the lower was the temperature required to kill 50 percent of the oysters. With rapid temperature increase, 13.2° C. per hour, 50 percent of the oysters were killed at 47.5° C.; whereas with a temperature rise of 0.74° C. per hour, 50 percent were killed at 41° C. Thus the upper lethal temperature of the oyster depends upon the rate of temperature rise. The oysters also lost body fluids in response to the heat shock. The amount of fluid lost varied inversely with the rate of temperature rise, i.e. oysters heated slowly lost more body fluids than oysters heated rapidly.

In the second series of experiments oysters were placed directly into constant temperature baths thus utilizing an abrupt rather than a gradual thermal change as was done in the first series of experiments (fig. 3). No heat death occurred among oysters maintained at 35° C. Twenty-nine percent were killed after three hours at 40° C. Fifty percent were killed after 25 minutes at 45° C. The higher the temperature of the water bath, the faster the oysters were killed. The loss of body fluids was also determined at the time the oysters were removed from the water baths. The results (fig. 4) indicated a relationship between exposure time, temperature, survival, and body-fluid loss. However, the relationship is not a simple one for an oyster does not die when it has lost a definite percentage of its original body weight as body fluid. A higher temperature, e.g. 45° C., caused greater fluid loss and more rapid death than did a lower temperature 42° C. Furthermore, for the same exposure period, greater survival and less fluid loss was evident at 42° C. than at 45° C. At the 50-percent survival level more body fluid was lost by oysters maintained at 45° C. than at 42° C. Oysters replaced in the holding tanks after removal from the water baths were able to take back some of the fluid they had lost.

Fig. 2 - Examining oysters in the holding tanks.

* Department of Zoology, Newcomb College, Tulane University, New Orleans 18, La.

1/ This study was conducted under a contract between Tulane University and the U. S. Fish and Wildlife Service. It was financed with funds made available by P. L. 466, 83rd Congress, approved July 1, 1954 (referred to as the Saltonstall-Kennedy Act).

The results of these experiments support the hypothesis that generalized bleeding is one of the responses of oysters exposed to injurious stimuli. Apparently oysters have not evolved protective mechanisms since they are able to shut their shells and isolate themselves from injurious agents in their environment. However, when they are unable to counteract the harmful stimuli, the generalized response appears to be a loss of body fluids.

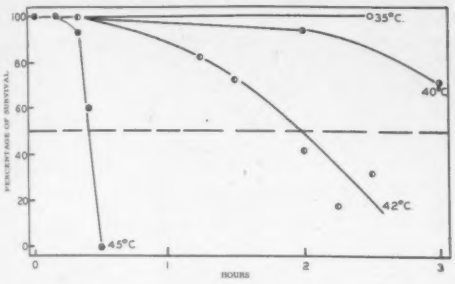

Fig. 3 - Effect of water temperature and duration of immersion on the survival of southern oysters.

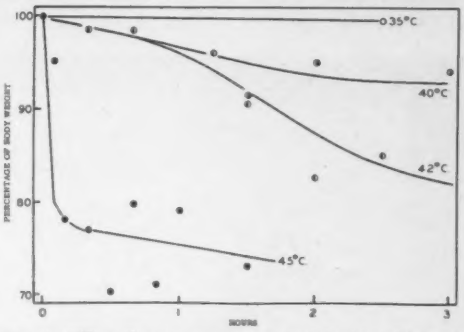

Fig. 4 - Effect of water temperature and duration of immersion on the loss of body fluids in southern oysters.

During some preliminary experiments the observation was made that not all the oysters killed by the heat shock gaped as had been assumed by another investigator. The more rapid the rate of temperature rise, the greater the percentage of oysters that are killed with their shells closed tightly. Commercial users of oyster-shucking machines are faced with a problem in this regard because the machines are designed on the theory that all steamed oysters will gape.

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1956. Some Factors Affecting Fluid Loss in Southern Oysters. Commercial Fisheries Review, vol. 18, no. 1, (January), pp. 10-11.

DESCRIBING THE STATE OF THE SEA

The state of the sea may be expressed according to the following scale:

Height of Wave	Description of Sea
0 or less than one foot	Calm sea
1 to 2 feet	Smooth sea
2 to 3 feet	Slight sea
3 to 5 feet	Moderate sea
5 to 8 feet	Rough sea
8 to 12 feet	Very rough sea
12 to 20 feet	High sea
20 to 40 feet	Very high sea
40 feet and over	Precipitous sea

--Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.

NEW DIVING SLED

By Reidar F. Sand*

A new tool for close-up views of fishing gear in operation has been added to the diving accessories used at the U. S. Fish and Wildlife Service gear research and development station at Coral Gables, Fla. This device, a controllable two-man

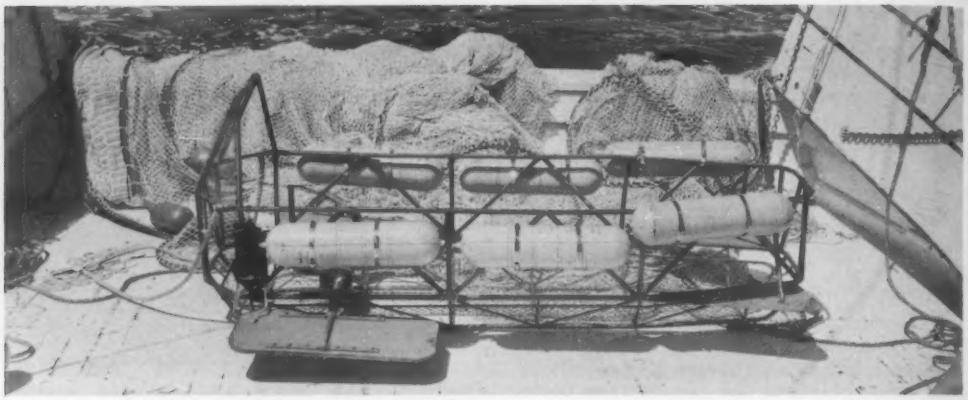


Fig. 1 - Two-man diving sled on the deck of the Service's M/V George M. Bowers is controlled by an operator in front. The second man in rear is free to make observations and photographs.

submersible sea sled, allows the Service diving team to make on-the-spot observations of trawls, nets, and other gears while under tow from the research vessel.

The diving sled was fashioned by modification to an Air Force-type tubular steel ambulance litter. The litter frame forms the bottom of the sled and extensions of tubular steel to shoulder height of the sled occupant in sitting position form a guard rail affording a greater degree of comfort and protection than possible in free diving operations. Two 18" x 24" marine plywood control surfaces are located low and forward to effect the best control. These control surfaces are actuated by a single-stick aircraft-type control column using three 45° bevel gears allowing both vertical and lateral control. Steel fins added at the rear of the sled give additional stability to the vehicle.

A "windshield" of $\frac{3}{8}$" lucite is installed forward to relieve sled occupants of some of the impact of water slipstream. Six Air Force-type 400 P.S.I. oxygen bottles are strapped to the upper sled rail giving the vehicle a slightly positive buoyance. The original steel-mesh webbing on the bottom of the litter provides a nonskid cockpit for the craft.

While under tow at either of two towing points forward, the sled has demonstrated a high degree of maneuverability and is capable of descending and ascending easily, and of performing complete rolls.

Both occupants of the sled wear SCUBA (self-contained underwater breathing apparatus) allowing full freedom of motion for piloting the craft and for observations. Other protective diving gear includes CO_2 inflated life preservers, diving knives, quick-release life belts, shark repellent, and depth meters.

* Chief, Gear Research and Development Program, Exploratory Fishing and Gear Development Section, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Coral Gables, Fla.

Fig. 2 - An exposure meter for underwater use is examined by divers of the Coral Gables gear research and development staff. For safety in operations a three-man diving team is used, consisting of a sled operator, underwater photographer and safety man, who remains on "standby" in the skiff.

This handy research tool has allowed researchers to observe and inspect trawls and other gears from all angles and distances, and come into actual contact with the gear

Fig. 3 - Divers put on equipment in the skiff and then transfer to the sled. The fully equipped safety man stays in the skiff.

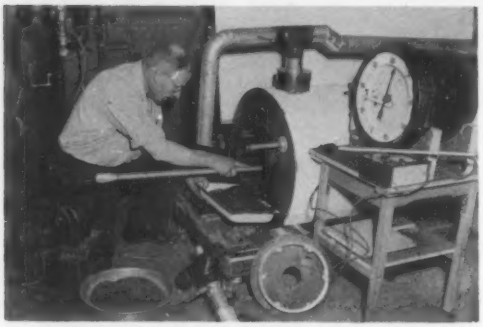
Fig. 4 - In position above trawl net, divers descend to make underwater pictures.

while under tow at speeds to $3\frac{1}{2}$ knots. Still and motion picture photography have been accomplished safely to depths of 60 feet. When observations with the underwater television gear or remote camera device are not feasible, the diving sled has been found to be quite useful and a valuable aid to fishing-gear research.

RESEARCH IN SERVICE LABORATORIES

EXPERIMENTAL FISH MEAL DRYER

A small laboratory-scale direct-heat dryer has been constructed at the Service's Seattle Fishery Technological Laboratory for use in the research on the nutritive value of fish meal. It consists of (1) a rotating inner drum with parallel vanes to distribute and tumble the meal while drying; (2) a stationary drum or housing to confine and direct the hot gasses around the rotating drum; (3) a nozzle-type gas burner as a heat source; and (4) accessories--drum motor, exhaust fan, thermocouples, and air ducts. The dryer is 60 inches long and 24 inches in diameter, with the inner rotating drum 30 inches long by 12 inches in diameter. Press cake is dried within about an hour's time in batches; four to five pounds of meal are dried per batch. The temperature within the dryer can be maintained at a predetermined setting with a range in the uniformity from one point to another of about 3° F.; the temperature is adjusted by manual manipulation of the gas flow by means of an indexed needle valve.



Removal of meal from the laboratory-scale direct-heat fish meal dryer.

In preliminary experiments, whole herring and tuna waste were dried successfully. The dryer will be used in preparing samples of meal under carefully controlled conditions for study in collaborative tests under way between Fish and Wildlife Service, the University of California, and the University of Wisconsin.

EXPERIMENTAL BULK OCEAN SHIPMENTS OF ALASKA HERRING MEAL

In recent years a serious economic problem of the Alaska herring meal and oil industry has been the high cost of handling the meal in sacks at the reduction plant and at the ultimate destination. Handling and shipping the meals in bulk has been suggested as a possible solution to the problem. This presents another problem, namely, the danger of spontaneous heating of the herring meal, which, in ocean shipment, can be serious.

During the summer of 1956, investigations were initiated at the Fish and Wildlife Service technological laboratories in Ketchikan, Alaska, and Seattle, Wash., to study the problem of bulk-handling herring meals. Plant tests, recently conducted

Brailing pursed herring destined for reduction to herring meal.

by a technologist from the Ketchikan laboratory, indicated that the addition of an oil antioxidant to the meal as it leaves the dryer was effective in reducing the temperature of herring meals stored in confined areas. Additional experimental work is necessary, however, before all the answers to these problems are known.

PROCESSING STUDIES ON MENHADEN MEAL

Bacteriological, chemical, and engineering investigations of current practices in the curing of menhaden fish scrap have indicated the possibility that the present routine "pile-turning" practices could be modified to the advantage of the processor. The studies are part of an extensive U. S. Fish and Wildlife Service research program on fish meals supported by funds made available through Public Law 466, commonly known as the Saltonstall-Kennedy Act of 1954.

These investigations constitute the second phase of the fish-meal processing studies initiated last year. An important conclusion already made, as a result of the investigation, has been to question the practice of routine "turning" of piles of scrap one or more times a day to dissipate the heat generated in the interior. Temperatures of the interior of the piles will be determined by suitable temperature-indicating devices. It is probable that there are two factors, oxidative and bacterial, responsible for the increase in temperature, and an evaluation is being made of their comparative importance. Recommendations can then be made regarding need for alterations in methods of handling.

The investigations are being conducted at the plants in the various areas where menhaden are utilized. The mobile trailer laboratory, assigned to the Service's Fishery Technological Laboratory, College Park, Md., has been suitably equipped and is being used for the bacteriological and chemical aspects of these studies.

ANTIOXIDANTS IN FISH MEALS

Continuing studies on the synergistic effect of mixtures of antioxidants in minimizing oxidative deterioration in fish meal have revealed that the effectiveness of a given antioxidant or mixture of antioxidants depends on how well it is mixed in with the meal. This research is being undertaken in the Department of Food Technology at the University of California in collaboration with the Seattle Fishery Technological Laboratory of the U. S. Fish and Wildlife Service as a part of the research program under Public Law 466, commonly referred to as the Saltonstall-Kennedy Act of 1954. The antioxidants that have been studied so far are butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT), diphenyl-paraphenylenediamine (DPPD), nordihydroguaiaretic acid (NDGA), and 1, 2-dihydro-2, 2, 4-trimethyl-6-ethoxyquinoline. Of these, the last appeared to be the most effective single antioxidant. Mixtures of the antioxidants appear to have an enhanced effect. Subsequent to the inception of these studies, the use of DPPD for this purpose has been prohibited by the Food and Drug Administration, pending further investigation of its physiological effects.

In work at the Seattle Technological Laboratory, these findings on the necessity of thorough mixing of antioxidants and meal were confirmed independently. It thus appears that the usefulness of antioxidants in reducing oxidative deterioration in commercial fish meals is quite promising, and further research should be very profitable. The choice of antioxidant or of mixtures of antioxidants is determined by the following criteria:

1. Effectiveness in inhibiting oxidation.
2. Adaptability to commercial processing conditions.
3. Cost.
4. Toxicological properties and Federal approval.

CONVERTING FISH SCALES INTO ANIMAL FOOD

Contrary to general opinion, fish scales are digestible and the U. S. Fish and Wildlife Service is seeking the best ways to make the high-protein content of this waste available for animal food.

Two research studies on utilization of fish scales are in process. One, at the Service's Fishery Technological Laboratory at College Park, Md., in cooperation with Georgetown University has already proved that dried ground pollock scales are readily digested by rats used as experimental animals. The second stage, now in progress, will involve experimentation to determine the composition of a diet designed to utilize fully the nutritive value of the scales.

The second study, being conducted at the University of Massachusetts, involves modification of the scales by chemical treatment before feeding them to rats and chickens. The work in Massachusetts is being done under a Saltonstall-Kennedy Act (1954) contract.

Experimentation was started to find a way to utilize profitably fish scales which for many years have been nothing more than a troublesome waste material.

There has been a market for certain types of fish scales for some years, but the market demand and the supply have failed to coincide in most instances. Some years ago it was learned that fish scales could be used to make foam-firefighting

material. Lack of an available supply of suitable fish scales forced the makers of firefoam to seek other material for their operations. The iridescent matter on fish scales, known as pearl essence, is also used in making jewelry and certain lustrous paint but the scales of only one or two species of fish are all that have been successfully used in this work.

SALMON WASTE AS BAIT

An interesting development in southeastern Alaska during recent years has been the growth of industries utilizing selected portions of the waste from salmon canneries as bait.

A few years ago, a West Coast bait company started collecting large quantities of chum salmon eggs for packaging and sale to sports fishing enthusiasts. This operation is still in progress. A small industry has developed this year from the collection, packaging, and freezing of pink salmon heads for use as bait in the commercial halibut fishery. The use of salmon heads as a halibut bait is not new. In the past, individual fishermen have collected fresh heads during the canning season. The present innovation, however, is the first effort to be made in this area to make frozen salmon heads available commercially on the same basis as frozen bait herring.

BREADED SHRIMP INTERIM FEDERAL SPECIFICATION

The Interim Federal Specification for "Shrimp, Breaded, Raw; Frozen," PP-S-00315, was issued July 12, 1956, by the General Services Administration (GSA). This specification was developed by the Quartermaster Food and Container Institute for the Armed Forces and the U. S. Fish and Wildlife Service, based on currently-available technical information. It has not been approved for promulgation as a Federal Specification and is subject to modification. It will be converted to a Federal Specification after further industry and Federal agency conferences. Government purchases are customarily made on the basis of specifications developed by Government-employed experts in the various fields with cooperation from industry.

Fig. 1 - Cooked and peeled shrimp on automatic grader prior to being breaded and packaged.

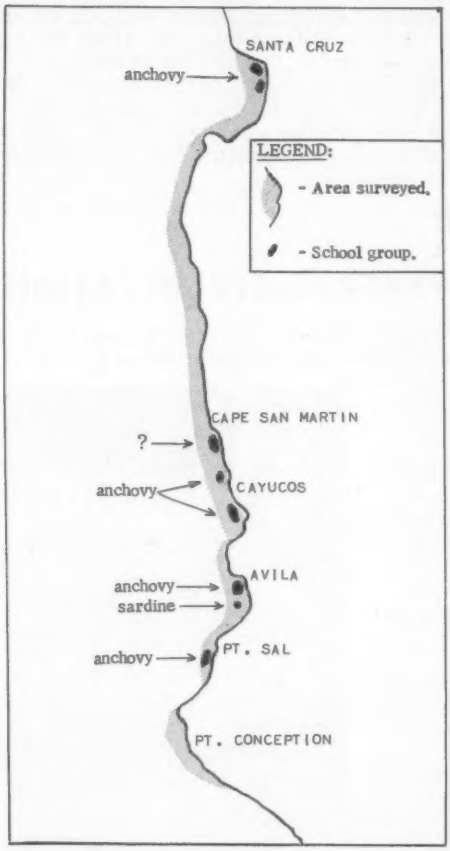
The specification deals with the quality-level required, species of shrimp to be used, allowable percentages of breading, composition of breading, and packaging methods and materials for specific uses. Processors when preparing frozen raw breaded shrimp for Government purchase, whether for civilian or military use, should be governed by the requirements of this specification although its use, at this stage of development, is usually optional.

Single copies of this specification required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo.; Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D.C.

TRENDS AND DEVELOPMENTS

California

ABUNDANCE DETERMINATION OF SARDINES AND ANCHOVIES IN CENTRAL CALIFORNIA (Airplane Spotting Flight 56-6): To determine the abundance and distribution of sardines and anchovies in the inshore area of Central California between Santa Cruz and Pt. Conception was the purpose of an airplane spotting flight on July 30 conducted by the California Department of Fish and Game Cessna "170" (1359D).



Airplane spotting flight 56-6 (July 30, 1956).

This flight was scheduled to cover the area between Bodega Bay and Pt. Conception, but fog prevented scouting of the entire area north of Santa Cruz and of small areas near Pt. Sal and Pt. Buchon. A total of 280 miles of coastline were covered, in which 110 schools of anchovies, totaling 898,000 sq. ft., 2 schools of sardines totaling 6,700 sq. ft., and 15 unidentified schools were observed.

In June 1956, 465,000 sq. ft. of anchovies were observed in the San Simeon-Pt. Conception area, whereas on this flight 715,000 sq. ft. of anchovies were tallied in this area, indicating an increased concentration over last month. In the Monterey Bay area 491,000 sq. ft. of anchovies were tallied in June and 182,700 sq. ft. in July. Inasmuch as the area between Santa Cruz and Davenport was not scouted, it is not certain whether the above figures for Monterey Bay indicate a true decrease.

Two small schools of sardines were seen five miles south of Avila. Three days previous to this flight two commercial aerial spotters scouted the area from Morro Bay to Pt. Conception and found only a few small sardine schools in the area between Pt. Arguello and Pt. Conception. No schools of any species were observed in the area between Pt. Conception and Pt. Arguello on this flight.

Fifteen schools of unknown species were observed in shallow water three miles south of Cape San Martin. Two of these schools were black in color and close observation failed to distinguish individual fish or flashes. The other twelve schools

were reddish-orange in color and may have been either juvenile anchovies or juvenile rockfish.

* * * * *

FIRST SILVER SALMON TAKEN IN SACRAMENTO RIVER: Possibly the first adult silver salmon ever taken in the Sacramento River has been trapped at California's Department of Fish and Game tagging station at Fremont Weir near Knights Landing.

Silver Salmon (Oncorhynchus kisutch)

Fisheries biologists say there is little doubt that the 16.7-inch fish was the first return from some 60,000 yearling silvers planted in Mill Creek last spring. Some of these fish were as much as nine inches long when stocked in the creek, which is a major salmon and steelhead spawning tributary of the Sacramento.

It is not unusual for steelhead to be planted as yearlings in the spring and return upriver from the ocean in the fall. The silver salmon trapped and examined by the biologists was mature and probably would have spawned later this fall.

The experimental plant of silvers was made in the hope that a run of silvers could be established in the Sacramento system. They enter coastal streams both north and south of the Golden Gate, but never have entered the Sacramento River system before.

Albacore tuna tagging by M/V N. B. Scofield (Cruise 56-S-3, July 2-23, 1956).

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ALBACORE TUNA TAGGED BY M/V "N. B. SCOFIELD" (Cruise 56-S-3): To tag albacore with type G "spaghetti" tags as a part of migration and growth studies; to experiment with different colored tags to determine if tag color has any relationship with tag recovery success; and to make biological and oceanographical observations in respect to occurrence of albacore were the objectives of Cruise 3 of the research vessel N. B. Scofield of the California Marine Fisheries Branch. The vessel left San Pedro July 2, 1956; fished the area off the coast of Southern California and northern Baja California encompassed by latitude 29° N. to 32° N. and longitudes 116° W. to 119° W.; returned to San Pedro July 23.

Albacore were caught by means of both live bait and trolling jigs. All albacore caught in good viable condition were tagged, measured, and released. The red, white, and blue tags, all type G with jackets, were applied in alternating-color groups of five tags per group. General observations included Bathythermograph casts, weather, and incidental marine-life sightings.

A total of 420 albacore were tagged, 140 of each color, and released. All fishing was done in the vicinity of the commercial fleet, which was in full operation

during the cruise. Roughly two-thirds of the fish were caught trolling feather jigs and the remainder on bait. Rough weather and poor fishing during the first ten days greatly hampered the tagging operation.

Examination of albacore stomachs revealed that the Pacific saury (Cololabis saira) made up the bulk of the food. Quantities of red crab (Pleuroncodes sp.) and a species of rock fish, Sebastodes, were quite common in the fish from the southern extremity of the area fished. Large concentrations of tunicates (Pyrosoma sp.) were observed in the vicinity of lat. 31° -35' N., long. 118° -30' W. Finback and California gray whales were sighted on several occasions in the central and northern parts of the area fished. Night-light collections yielded mostly saurys and a few yet-to-be-identified fish. Fish of various species were collected from a bait net haul at Cape Colnett, Baja California.

M/V Lucky Star tuna-tagging Cruise 56-C-3 (July 2 - Aug. 3, 1956).

Surface water temperatures in the areas fished ranged between 16.1° C. (60.9° F.) to 18.6° C. (65.8° F.). Fishing was at optimum in the range 16.1° C. (60.9° F.) to 16.6° C. (62° F.). Fifteen Bathythermograph casts were made in the areas fished.

* * * * *

CLIPPER TAGS YELLOWFIN AND SKIPJACK TUNA (M/V "LUCKY STAR," Cruise 56-C-3): Tagging of yellowfin and skipjack tuna was accomplished by the tuna clipper Lucky Star on this cruise (July 2-August 3, 1956) conducted by the California Department of Fish and Game. Operations were concentrated off the coast of Baja California and Roca Partida Island (one of the Revilla Gigedo Island group). A total of 661 yellowfin and skipjack tuna were tagged and released with type "G" tags. Three types of colored tags were used: red, white, and blue.

Cans--Shipments for Fishery Products, January-June 1956

Total shipments of metal cans during January-June amounted to 51,991 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 45,137 tons in the same period of 1955. The increase in this year's shipments reflects the heavier pack of canned tuna as compared with the January-June 1955 period (when production was curtailed due to oversupply) and also the increased activity in the packing of Maine sardines, salmon, and other fishery products which begins in June.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE, JULY 1956: For the use of the U. S. Army, Navy, Marine Corps, and Air Force the Army Quartermaster Corps in July 1956 purchased 3,184,000 pounds (valued at $1,615,000) of fresh and frozen fishery products. This was 16.3 percent more in quantity and 30.8 percent more in value than purchases the previous month and 57.5 percent more in quantity and 98.6 percent greater in value than purchases in July 1955.

Purchases of Fresh and Frozen Fishery Products by Department of Defense (July and the First Seven Months of 1956 with Comparisons)

QUANTITY				VALUE			
July		Jan.-July		July		Jan.-July	
1956	1955	1956	1955	1956	1955	1956	1955
(1,000 Pounds)				($1,000)			
3,184	2,022	15,415	15,136	1,615	813	7,705	6,441

During the first seven months of 1956 purchases of fresh and frozen fishery products totaled 15,415,000 pounds (valued at $7,705,000)--1.8 percent more in quantity and 19.6 percent more in value than purchases for the same period a year earlier. This shows that this year purchases were composed of higher-priced products.

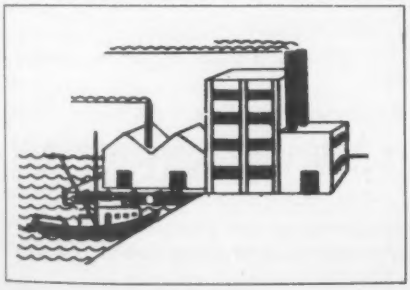
Prices paid for these fishery products by the Department of Defense in July averaged 50.7 cents a pound as compared with 45.1 cents a pound the previous month and 40.2 cents a pound in July 1955.

In addition to the purchases of fresh and frozen fishery products reported, the Armed Forces generally make some local purchases which are not included in the data given. Therefore, actual purchases are higher than indicated, but it is not possible to obtain the local purchases made by military installations throughout the country.

CORRECTION: In the August 1956 issue of Commercial Fisheries Review in the news item "Federal Purchases of Fishery Products," the first sentence of the first paragraph should have given the May 1956 purchases as "2,715,000 pounds" instead of "2,715 pounds" as shown. The figures which appeared in the table shown in that issue were correct.

* * * * *

CANNED FISHERY PRODUCTS PURCHASED THROUGH QUARTERMASTER MARKET CENTERS, APRIL-JUNE 1956: Canned tuna and sardines were the principal canned fishery products purchased for the use of the U. S. Army, Navy, Marine Corps, and Air Force by the Army Quartermaster Corps through its Market Centers during the second quarter of 1956. Purchases amounted to 792,000 pounds of canned tuna and 219,000 pounds of canned sardines.



Canned Fishery Products Purchased Through Quartermaster Market Centers, January-June 1954-55

	Tuna	Salmon	Sardines
	(1,000 pounds)		
Jan.-June 1956	2,188	601	227
Jan.-June 1955	716	2,236	63
Jan.-June 1954	939	471	9

It is believed that only a portion of the requirements for canned sardines are represented in the data given since some canned sardines and canned fishery products other than tuna and salmon are procured locally and no information is available on those purchases. Therefore, actual canned fishery products purchases are higher than indicated.

Films

FISHERY FILMS SHOWN AT VENICE EXHIBITION: The four Department of the Interior documentary films which were recently selected for showing at the Edinburgh Film Festival were also chosen for display at the International Exhibition of Cinematographic Art at Venice, Italy it was announced August 17. The films were to be shown in the Exhibition of Documentary and Short Length Films, a section of the International Exhibition, August 16 to August 25. The films are 16 mm. with color and sound.

"Outboard Fisherman U. S. A."

The four films were produced by the Department of the Interior in cooperation with industry. Two of the films were made under the direction of the Bureau of Mines and two under that of Fish and Wildlife Service.

Fish and Wildlife Service films have been honored at the Venice International Exhibition on four other occasions. One Service film It's the Maine Sardine, won first place in the public relations catagory in 1949.

The Fish and Wildlife Service films selected for the Venice exhibit are:

Outboard Fisherman U.S.A. shows the taking of fish in ten different parts of the country from Maine to Alaska. It was sponsored by the Outboard Marine and Manufacturing Company of Milwaukee, Wis.

Shrimp Tips from New Orleans, sponsored by the Peelers Company of that city, makers of processing equipment, portrays the culture and glamour of the southern metropolis--and six of its favorite shrimp recipes.

The Bureau of Mines films selected for the Venice exhibit are:

The Petrified River--The Story of Uranium, a documentary of the greatest metal hunt in history. It was sponsored by the Union Carbide and Carbon Corporation and tells the story of uranium from its source to many of its peacetime applications.

Arizona and Its Natural Resources, a film sponsored by the Phelps-Dodge Corporation shows how the mineral and agricultural resources are being developed and utilized for the benefit of mankind.

These films may be secured on a loan basis without charge. Only one of them, however, Arizona and its Natural Resources, is available at the present time. The other three will probably be ready for distribution in September.

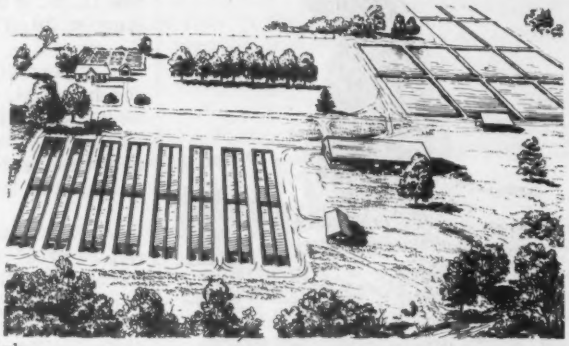
The United States Government films are selected for international showing by the Interdepartmental Committee on Visual and Auditory Materials for Distribution Abroad.

Other Department films which have been shown in Venice are: The Story of Menhaden, 1951; Food for Thought, 1950; Filleting and Packaging Fish, 1947; and California and its Natural Resources, 1949.

Note: Also see Commercial Fisheries Review, August 1956, p. 23.

Fish Hatcheries

WORK ON SIX NEW HATCHERIES STARTS: Engineering work on the $2,856,000 Federal fish-hatchery program which has received Presidential approval will begin at once, and actual construction will get under way as quickly as possible, Secretary of the Interior Fred A. Seaton said August 17.



Of the total available, $1,060,000 is for six new hatcheries, two of which will be enlarged replacements for existing facilities. Two hatcheries are being constructed for the propagation of trout only, two for warm-water fish only, and two are combination facilities for both trout and warm-water fish.

Both catchable-size and fingerling trout will be produced. The warm-water hatcheries will rear walleye and northern pike fry, and bass, bluegill, and catfish fry and fingerlings. The six new hatcheries will be located at Miles City, Mont.; Pittsford, Vt.; John Rock area near Brevard, N. C.; Paint Bank, Va.; Cedar Bluff, Kans.; and one in West Virginia.

Frozen Foods Temperature Tolerance

Although no fishery products are involved, results of a research project on time-temperature tolerance of frozen foods are of interest to packers and distributors of frozen fishery products. Industry and government representatives discussed these results in a conference held July 30-August 1 at Albany, Calif. The project was begun several years ago in the Western Utilization Research Branch of the U. S. Department of Agriculture.

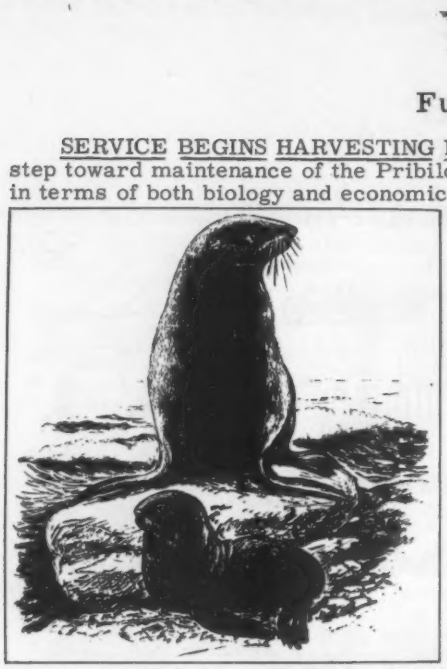
The project was to obtain information for use in the commercial handling of frozen foods from producer to consumer. From a few at the beginning, thousands must handle and use commercial frozen foods. As frozen foods move from packer to warehouse to distributor to retail store and consumers, they move in diminishing unit quantities and into custody or ownership of an increasing number of people.

The results establish, for each frozen food, just how much faster quality change takes place at 10° F., 20°, or 30° than at 0° Products change at different rates under the same conditions. Partial damage, no matter how minute or slightly detectable on casual examination, is never reversed by reduction of temperature. By and large, geographical variations were found to be small. Within limits, certain

changes in raw material and processing (including packaging) strengthen frozen foods against temperature hazards.

Fur Seals

SERVICE BEGINS HARVESTING FEMALE SEALS OF PRIBILOF HERD: As a step toward maintenance of the Pribilof Islands fur-seal herd at an optimum level--in terms of both biology and economics--the 1956 operations have been expanded to include the harvesting of some female seals, the U. S. Fish and Wildlife Service announced August 30, 1956.



About 30,000 females are to be taken in the harvest, and the information which will be obtained this year relative to the time and conditions for taking females will give the Service, which has the responsibility for the seal herd, the design of its future operations.

The Pribilof Islands fur-seal herd was near extinction in 1911 when pelagic sealing--harvest on the high seas--was banned by treaty. The herd numbered only 125,000 animals at that time, compared with 1,750,000 today. The first step in restoration of the herd following ratification of the 1911 Convention was to discontinue all land killing for five years. At that time killing of males was resumed, but was limited only to those surplus to the needs of the growing herd. All of the females were needed during this restoration period, but a part of the male population was surplus because these animals are polygamous, having harems of 50 or more females, although at birth they are present in equal numbers. By this method of management, approximately 2 million surplus male seals were killed during the restoration. The herd now is fully restored.

Service officials anticipate that killing 30,000 cow seals a year will relieve the congested rookeries and reduce pup mortality. As a result of the increased pup survival, because half of them are males, there will soon be more three- and four-year males in the herd and a larger harvest possible without any decline in the herd's productivity. In short, an added harvest is substituted for annual mortality.

Service officials intend to pay particular attention to the size and condition of the herd during the taking of the females. The harvest of females, the first such harvest in nearly 50 years, began with the regular season--mid-June--and continued until August 15. Operations will be resumed early in September and will continue until mid-October 1956.

Since it has been nearly 50 years since American sealers have taken female pelts, little is known about the time when the quality of these skins is best, or the best conditions under which the females should be harvested. Records are being kept on a day-to-day basis on the condition of the pelts, the condition of the rookeries, the difficulties encountered in taking the cows, the effect of weather, the effect of late season operations as well as comments and suggestions on harvest operations. Each female skin will be marked in such a way that the date of taking can be determined at any stage of the processing. In this way it will be possible to learn the periods at which the skins are at their top value.

The male pelt is best when the animal is three or four years old. Since the old bulls maintain harems of between 25 and 100 cows, and drive the younger males away from the herd, the age group wanted for harvest is automatically segregated. The harvesting policy of 65,000 males annually permits about 10 percent of the younger bulls to reach breeding age--the seventh year--and establish harems.

As far as is known now, the female pelt is good at any mature age. This considerably widens the harvest age of the seal herd. The life span of the fur seal is about 19 years, and the female begins to bear young at about three years. The female seals arrive on the Pribilofs early in June after almost a year at sea. The old males precede them by two or three weeks and the younger seals follow them by a week or two. The pups are born shortly after the females arrive at the rookeries. Each has but a single pup--average weight 12 pounds--in any one year. The nursery season for the new pup is also the new mating season.

The Pribilof Islands in the Bering Sea are five in number, the largest being St. Paul Island. It is 14 miles in length. St. George Island, 40 miles away, is second in size--about 10 miles in length.

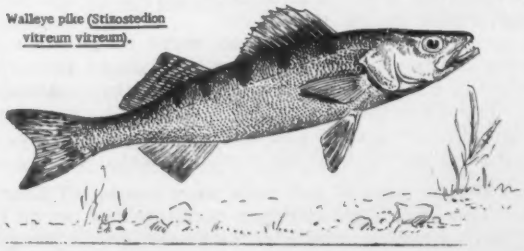
Records show that before 1834 the Russians, who at that time owned Alaska and the Pribilofs, took 2 million seal pelts. Because of the decrease in the size of the herd, the Russians placed restrictions on the harvest and from 1834 until the United States took over the Islands with Alaska in 1867, only 600,000 pelts were taken.

From 1870 until 1910 the United States permitted the land killing of seals on a lease basis. During the first 20-year period the taking of 100,000 pelts a year was permitted. The total harvest for that period was 1,927,377 pelts which brought the United States Government $6,020,152 in revenue. During the next 20 years there was a sharp decrease in numbers of seals and the take was only 342,651 pelts for which the Government received $3,453,844. In addition, many thousands of seals were killed during this period by small vessels operating on the high seas without regard for the future of the resource. Pelagic sealing was wasteful, since many killed animals were lost, and since the killing was indiscriminate.

Then in 1911, pelagic sealing was banned and land killing was discontinued for five years. Since then the harvesting of the Pribilof Islands' seals has been exclusively on land as a United States Government responsibility, administered first by the Secretary of Commerce and now by the Secretary of the Interior.

Great Lakes Fishery Investigations

WALLEYE ABUNDANCE IN SAGINAW BAY DURING SUMMER STUDIED BY M/V "CISCO" (Cruise 3): To determine the species composition and abundance of of fishes in shallow water during the summer, with special attention given to walleye, was the purpose of Cruise 3 (July 11-23, 1956) of the Service's research vessel Cisco. This cruise was confined entirely to Saginaw Bay and portions of Lake Huron immediately adjacent to the Bay. During the summer walleye practically disappear from the commercial trap-net fishery of the Bay.



Walleye pike (Stizostedion vitreum vitreum).

Nylon gill nets with $2\frac{1}{4}$-, $2\frac{1}{2}$-, $2\frac{3}{4}$-, 3-, and 4-inch mesh were set on the bottom at 4 fathoms just north of Charity Island and in $2\frac{1}{2}$-3 fathoms north of Sand Point, and another gang made up of $2\frac{1}{2}$- and $3\frac{1}{2}$-inch mesh was set in 3 fathoms off Au Sable Point. White suckers (Catostomus commersonnii) predominated in the catches off Au Sable Point and Sand Point and white suckers and alewives (Pomolobus pseudoharengus) made up the bulk of the catch off Charity Island. Three walleye (Stizostedion vitreum vitreum) were taken off Charity Island and 8 off Sand Point. Their lengths ranged from 11.5 to 19.7 inches. A moderate number of yellow perch (Perca flavescens) were caught in the smaller mesh sizes of nets set off Charity Island and Sand Point. Other species taken included 1 yellow bullhead (Ameiurus natalis), 2 channel catfish (Ictalurus lacustris), and one white bass (Lepibema chrysops).

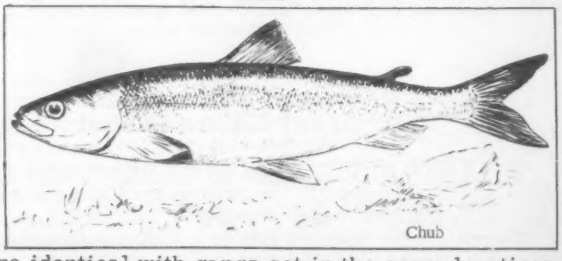
The usual oblique sets of $2\frac{1}{2}$-inch-mesh gill nets were made in 13 and 26 fathoms off East Tawas, and in addition an oblique set of $3\frac{1}{2}$-inch-mesh nets was made at 13 fathoms. The $3\frac{1}{2}$-inch mesh took only two perch and one bloater (Leucichthys hoyi), all at mid-levels. The $2\frac{1}{2}$-inch set in 26 fathoms took 2 perch, 1 Leucichthys kiyi, 6 smelt (Osmerus mordax), and 1 bloater, scattered throughout the net except in the top 20 feet. Thirty-three bloaters, 12 smelt, and 3 perch were scattered throughout the shallow set. A $2\frac{1}{2}$-inch-mesh bull net 300 feet long and 120 meshes deep was set over a 26-fathoms bottom with its float line 6 feet below the surface. This net took 7 Leucichthys alpenae, 1 alewife, 9 smelt, and 1 perch.

Bottom trawling was carried out in several locations at depths ranging from $2\frac{1}{2}$ to $10\frac{1}{2}$ fathoms. Catches included mostly perch, smelt (approximately 4,750 of this species were taken in one 10-minute tow), alewives, and forage fish. Several white suckers and one carp (Cyprinus carpio) were also caught. Night midwater trawling was done in shallow water off Oscoda, Mich.; alewives dominated the catch.

The hydrographic transects from Bay City to East Tawas, East Tawas to Harbor Beach, East Tawas to Oak Point, and Hat Point to Au Sable Point were run as in the previous cruises. Surface temperatures ranged from 14.6° C. (58.3° F.) to 23.5° C. (74.3° F.).

* * * * *

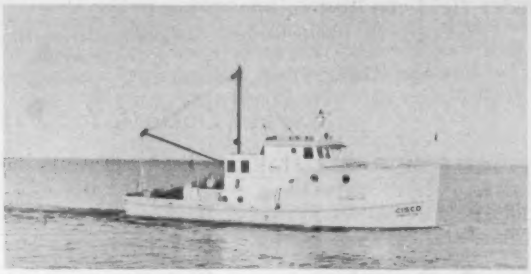
CHUB POPULATION STUDIED IN LAKE HURON BY M/V "CISCO" (Cruise 4): Work in Lake Huron by the Service's research vessel Cisco during Cruise 4 (July 31-August 13, 1956) was primarily to investigate further the chub population. This cruise, duplicating Cruise 2, covered Saginaw Bay and part of southern Lake Huron. Nylon gill nets (mesh sizes 2, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, 3, and 4 inches) were set in 25 fathoms off Harbor Beach and 50 fathoms in mid-lake between Harbor beach and Goderich. These gangs, except for the addition of the 2-inch mesh, were identical with gangs set in the same locations during Cruise 2. The shallow set caught mostly bloaters (Leucichthys hoyi) as in Cruise 2, but the catch was considerably smaller if the 2-inch mesh is not considered. The 50-fathom set caught mostly L. kiyi, with a few L. reighardi, lake herring (L. artedi), bloaters, and longjaws (L. alpenae). The catch of the latter species was much smaller than in the previous set.


Chub

Oblique sets of gill nets were made off East Tawas in 13 and 26 fathoms as usual. The very light catches consisted of perch (Perca flavescens), smelt (Osmerus mordax), herring, and bloaters scattered throughout the nets, but mostly from 40 feet below the surface to the bottom. A bull net (300 feet long, 120 meshes deep)

was set over a 26-fathom bottom with the float line in the thermocline and the lead line beneath it. Only 3 smelt were caught. One of the main purposes of the oblique sets and of fishing bull nets is to locate the summer grounds of the herring which enter Saginaw Bay in great numbers in the fall.

A gill net was set on the bottom in 4 fathoms off East Tawas. The rather light catch was predominately white suckers (Catostomus commesonnii), perch, and alewives (Pomolobus pseudoharengus). Of special interest were two rainbow trout (Salmo gairdneri) and one brown trout (Salmo trutta) in the catch.



Cisco, Research vessel of the Service's Great Lakes Fisheries Investigations.

Several areas with good trawling bottom were located in Saginaw Bay. Large numbers of perch, smelt, and forage fish were taken in the trawls. Only one walleye was caught, and it is doubted that there are any large concentrations of this species in the Bay in the summer.

Collections were made with a seine in six areas along the northwest shore of Saginaw Bay in order to study the inshore fish faunas and especially to locate walleye fingerlings. No walleyes were taken, but good catches of perch and largemouth black bass (Micropterus salmaides) fingerlings were caught.

Hydrographic transects were run from Bay City to East Tawas, East Tawas to Harbor Beach, Harbor Beach to Goderich, East Tawas to Oak Point, and Hat Point to Au Sable Point. In addition to the usual limnological studies, photometer readings were taken at 23 stations. Surface water temperatures varied little over the Bay and Lake Huron proper, except for a narrow area of upwelling off the Canadian shore where a low reading of 12.1° C. (53.8° F.) was recorded. The highest surface temperature was 25.1° C. (78.4° F.) near the mouth of the Saginaw River in Saginaw Bay.

Ionizing Radiation Center Planned

Establishment of a Quartermaster Radiation Planning Agency to develop plans for operation of the Army Ionizing Radiation Center was announced early in September by the Department of the Army. The new Agency will function under the Quartermaster Research and Development Command at Natick, Mass. Eventually the agency will be located at the Army Ionizing Radiation Center, the site of which is yet to be selected.

In addition to planning operations of the Center, the new Agency will be responsible for integrating the Center's activities with those of the Quartermaster Food and Container Institute, Chicago, and other Quartermaster research organizations concerned with irradiation sterilization of food and other materiel. The Center, when in operation, is expected to have a peak capacity of 1,000 tons of irradiated food a month.

Research thus far conducted under the direction of the Army Quartermaster Corps has established the feasibility of utilizing nuclear emanations, such as gamma rays and electrons, instead of heat, to kill or inactivate micro-organisms which are responsible for food spoilage. The ultimate military and civilian advantages of the

process include a reduction in refrigeration requirements, reduced food losses, improved control of certain food-borne diseases, and a wider availability of fresh foods under field conditions, according to the Department of Defense release.

Market Outlook for Fishery Products

OCTOBER-DECEMBER, 1956: Good supplies of staple and specialty types of fish and shellfish will be available for the holiday and preholiday events of the fourth quarter, the U. S. Fish and Wildlife Service reports in the Commercial Fisheries Outlook, October-December 1956, issued October 16.

The quarter will be highlighted by a massive sales effort centered around the "Fish Parade," which is the industry's designation of its National Fish Week, October 29 to November 3. Such items as oysters, shrimp, crab, clams, lobster, salmon, halibut, tuna, sardines, fish sticks, and fillets, as well as other fish will be in good supply although the available quantities of some of these items will be lower than a year ago. Prices for fresh and frozen fish and shellfish products will be slightly higher, but the general level of canned fish will be somewhat lower.

The quarter should see additional interest resulting from the adoption of voluntary Federal standards for fish sticks and an upturn in that sector of the fishing industry is expected.

Cold-storage stocks are down about seven percent from last year, but supplies are still ample with some items even being in better supply. Landings will follow the seasonal pattern, which means reduced activities in some fisheries.

The Alaska salmon pack (low last year) shows a gain. The Alaska pack as of September 1 this year was 2,819,000 standard cases, a 21-percent increase over the pack of September 1, 1955. The total pink salmon pack was down slightly but increases in the red and chum salmon packs more than offset the loss.

Oyster production will be in evidence on all coasts although the Atlantic oyster beds are still showing the effects of the hurricanes of recent years. But more Pacific Coast oysters will be available. A heavy and growing demand for small oysters from new consumer groups in areas where oysters were formerly not readily available is one reason why supplies will be trailing demand. Prices will probably be somewhat higher.

Shrimp landings up to the end of August were below expectations but September and October are the peak months for shrimp production barring unforeseen weather conditions. Lobster production in Maine was down one third as of July 31 and the landings usually drop sharply during the latter part of the quarter. However, fair supplies for the lobster lovers are expected. Spiny lobster imports and holdings are up. Hard crabs in the East are in moderate or good supply while the production of the Dungeness crabs in California is expected to rise sharply during the

quarter. Surf clam landings in New Jersey are up 26 percent, but Maine soft clam landings are lower by 19 percent.

Canned tuna is in good supply with the pack already 13 percent ahead of the corresponding period of last year. The halibut supply is higher than in 1955 and will be close to 67 million pounds, due to the extended fishing period. Maine sardine production is below normal but higher than in 1955; California expects a fair pack of California sardines.

New England groundfish landings will go into the seasonal decline; cod production is traditionally low in the fourth quarter; haddock landings will hold up until the middle of the quarter when a decided drop can be expected; the downward trend in the harvest of ocean perch has been reversed, but the 1956 catch will be short of the 200-million-pound average for 1950-54.

National School-Lunch Program

Producers and distributors of fishery products are finding that the school-lunch program is a potent market for their products. Not only is it a growing market, but it represents an opportunity to cultivate a taste for fishery products by children during their formative years that will continue as they become the adult customers of the future. A large share of the U. S. Fish and Wildlife Service's educational and market development program consists of giving fish-cookery demonstrations before school-lunch supervisory personnel, to show the variety, versatility, and economy of fishery products in their menu planning.

A U. S. Fish and Wildlife Service home economist conducting a fish-cookery demonstration before school-lunch supervisory personnel, an important part of the Service's educational and market development program.

The school-lunch program is big business. The National School Lunch Program is in operation in over 56,000 schools located in all the 48 states and most of the territories and possessions. During the past school year, around 1.8 billion meals were served to 10.6 million children.

For this coming school year, Congress has appropriated $100 million. This is an increase of $16.7 million over last year. Nearly $84 million of this fund will be apportioned among the states, territories, and possessions, based on the number of children between the ages of 5 and 17, inclusive, and the need for assistance in each state. Each Federal dollar must be matched by $3 from sources within the state if the per capita income in the state equals or exceeds the national average. The grant-in-aid program is administered in the states by state departments of education in accordance with agreements between those departments and the United States Department of Agriculture.

In addition to the above apportioned funds, $15 million is available to the Department of Agriculture for the purchase and distribution to schools of foods which help to meet the nutritional requirements of school children. These foods are those which are in extra abundance or oversupply.

Most of the schools participating in the National Program serve a Type A lunch which includes two ounces of protein. If fish were used as the protein for only one meal a week in all the schools, it would require over 1.3 million pounds of boneless fish, such as fillets or canned, to serve the 10.6 million children.

Maine

NEW SARDINE FILM: The Maine Sardine Industry on August 16 started work on a new motion picture, which will be produced in cooperation with the U. S. Fish and Wildlife Service. The film will depict the use for and the home preparation of canned Maine sardines.

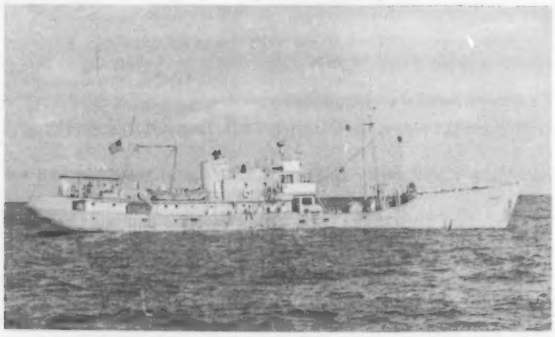
The Executive Secretary stated that a contract for the camera work had been let to a New York City firm and that shooting would start as soon as a script was completed and approved by the Maine Sardine Council. The production of the film will be under the direction of the Fish and Wildlife Service.

The 16 mm. film will be in full color with sound and will run for about 14 minutes. Approximately 75 copies will be obtained for national distribution. The film will be a follow-up to a previous film (It's the Maine Sardine) produced under the same type of cooperative arrangement.

Maine is to be the locale for much of the camera work and emphasis is to be directed on the convenience, low cost, high protein, and versatility aspects of canned Maine sardines as a food.

North Atlantic Fisheries Exploration and Gear Research

DIFFERENT TYPES OF TRAWL NETS TESTED (M/V "Delaware," Cruise 23 and M/V "Albatross III," Cruise 79): Experiments were conducted on various types of trawl nets in the Georges Bank area on a joint cruise of the Service's research vessel Albatross III and the exploratory fishing vessel Delaware between July 23 and August 4, 1956.



The Service's research vessel Albatross III.

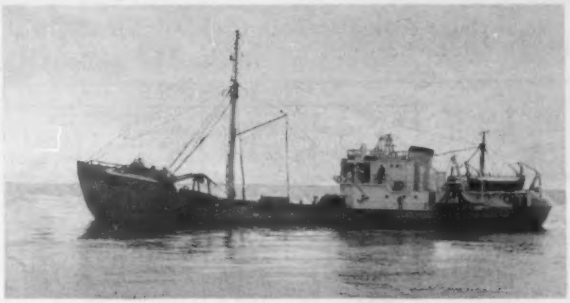
Mission of these tests was: (1) to compare the fishing powers of a high-opening trawl of new design with the trawl net now in standard use by the haddock fishery, and (2) to determine to what degree haddock escape through the meshes of various sections of the trawl.

In order to make the results most valuable and for comparison, the vessels towed the nets used side by side, as close together as possible. The simultaneous tows were conducted in three phases:

(1) Both vessels towing the standard #41 trawl to establish the uniformity of catching power of the nets of the two vessels. The catches of haddock by the two nets were found to be virtually uniform.

(2) The Albatross III towing the standard #41 trawl and the Delaware towing the special "Balloon"-type #41 trawl. Significantly lower catches of haddock were made by the "balloon" trawl.

(3) The Delaware towing the standard #41 trawl; the Albatross III towing a standard #41 trawl with large and small mesh in various sections of the net. The lower wings and bellies were found to be much more important in the escapement of haddock through the meshes than were the top wings and square.



The Service's research vessel Delaware.

Phase three was divided into three series of simultaneous tows with the standard 5-inch mesh #41 net of the Delaware and the $2\frac{1}{2}$-inch mesh #41 net of the Albatross III. Sections of $2\frac{1}{2}$-inch mesh were replaced by 5-inch mesh to determine escapement from various sections of the net. Both nets had $2\frac{7}{8}$-inch cod ends. The following groups of tows were made:

a. Seven simultaneous tows with the complete $2\frac{1}{2}$-inch mesh trawl.

b. Four simultaneous tows of the $2\frac{1}{2}$ inch mesh trawl with 5-inch lower wings.

c. Four simultaneous tows of the $2\frac{1}{2}$-inch mesh trawl with 5-inch lower wings, top belly, and lower belly.

The catches are summarized for each net for the three series of tows in the following table:

Length of Fish by 3-cm. Groups	a.			b.			c.		
	No. of Fish		Percentage Delaware	No. of Fish		Percentage Delaware	No. of Fish		Percentage Delaware
	Albatross	Delaware	of Albatross	Albatross	Delaware	of Albatross	Albatross	Delaware	of Albatross
18 & 21	68	8	12	26	9	35	39	40	103
24	951	318	33	370	227	61	218	324	149
27	3,541	1,705	48	1,733	1,508	87	1,205	1,403	117
30	3,041	1,801	59	1,736	1,798	104	1,355	1,941	143
33	780	319	41	508	548	108	477	628	132
36	734	576	78	459	663	144	926	748	81
39	972	1,069	110	563	832	148	1,193	1,109	93
42	515	770	150	311	505	162	803	859	107
45	141	241	171	104	206	198	229	336	147
48	27	52	193	21	31	148	95	94	99
51 to 66	20	66	330	38	30	79	92	61	66
Totals	10,790	7,185	-	5,869	6,357	-	6,632	7,543	-

The 5-inch mesh used in the forward parts of the trawl averaged about $4\frac{3}{4}$ inches, internal measurement. The $2\frac{1}{2}$-inch mesh averaged $2\frac{1}{2}$ inches, internally. The $2\frac{7}{8}$ inch cod ends averaged $2\frac{1}{2}$ inches internally.

The results show that many small-size haddock escape through the lower wings and bellies. The top wing and square appear to be unimportant for the escapement of haddock. Smaller catches of larger fish were made with the $2\frac{1}{2}$-inch trawl, indicating that the small-mesh net was not fishing as effectively as the 5-inch trawl.

In addition to the 64 simultaneous tows made by the two vessels, the Albatross III made 53 additional tows, comprising phases 4, 5, and 6 of the Albatross III operations.

In phase four alternate tows were made by the Albatross III with complete $2\frac{1}{2}$-inch mesh and 5-inch mesh #41 trawls to compare alternate tow and simultaneous tow (phase three) methods. Both nets had $2\frac{7}{8}$-inch cod ends. The pairs of alternate tows gave widely varying results, as was expected. A summary of catches by the $2\frac{1}{2}$-inch and 5-inch trawls is given in the table.

Lengths of Fish by 3-in. Groups	Number of Fish		
	$2\frac{1}{2}$-in. Trawl	5-in. Trawl	Percentage 5-in. Trawl of $2\frac{1}{2}$-in. Trawl
15 - 21	89	69	78
24	220	165	75
27	424	360	85
30	350	464	132
33	453	391	86
36	791	777	93
39	777	825	106
42	479	565	118
45	302	400	132
48	232	225	97
51 - 75	372	393	106
Total	4,489	4,634	-

Although extreme tow-to-tow variations caused results to be less reliable than the simultaneous tow data, it is shown that escapement takes place through the forward parts of the net.

Phase five was conducted to determine which part of the cod end was most effective for the escapement of haddock. The forward parts of the net were therefore unchanged during phase five, which consisted of four series of tows with a $4\frac{3}{4}$-inch (internal size) double-manila cod end with cover arranged as follows:

a. Covering the full length of the cod end (44 meshes).
b. Covering the after 22 meshes of the cod end.
c. Covering the after 16 meshes of the cod end.
d. Covering the after 11 meshes of the cod end.

The 50-percent point of the $4\frac{3}{4}$-inch cod end with full cover (a.--9 tows) was about 36 cm. This was 3 cm. lower than would be expected, due to certain characteristics of the twine.

With the cover over the after 22 meshes (b.--4 tows) and the after 16 meshes (c.--2 tows), the 50 percent point was unchanged. When moved down to cover only the after 11 meshes (d.--3 tows) the 50 percent point was lowered to about 34.5 cm.

Length of Fish by 3-in. Group	Number of Fish in		Percentage Retained in Wire-Mesh Cod End	Percentage Retained in a Standard $2\frac{7}{8}$-in. Cod End
	Cover	Cod End		
18	5	0	0	4
21	40	16	29	18
24	87	43	33	43
27	47	77	62	79
30	5	58	92	97
33	1	107	99	99
36 - 54	0	331	100	100
Total	185	632	-	-

It was thus demonstrated that most escapement takes place in the after quarter of the cod end under loads up to 2,000 pounds.

Phase six was conducted to determine if sharper selection could be obtained by using a cod end of rigid wire netting in which only slight variation in mesh size existed. A 7-foot long section of the wire mesh was put into the cod end from laceage to laceage in the effective escape area (near the after end) of a $2\frac{1}{4}$-inch mesh covered cod end. The wire was of diamond shape, measuring $2\frac{7}{8}$ inches in length and $2\frac{5}{8}$ inches in width. The number of fish caught in the wire-mesh cod end and cover are shown in the table.

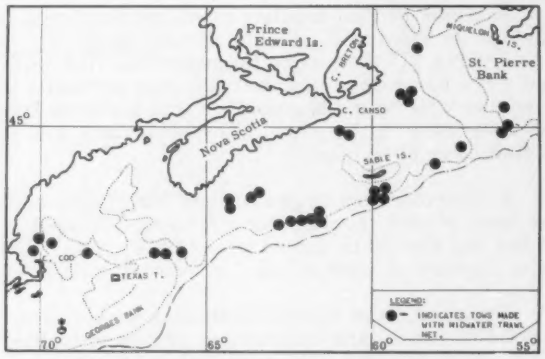
The percentages retained are shown in comparison with the percentage retention of a standard double-manila cod end of approximately equivalent size. The wire-mesh cod end shows rather duller selection than a standard manila cod end.

* * * * *

MIDWATER TRAWLING BY M/V "DELAWARE" FROM GEORGES BANK TO ST. PIERRE BANK YIELDS NO FISH (Cruise 24 and 25): Experimental midwater trawling by the exploratory fishing vessel M/V Delaware in an area from Georges Bank to St. Pierre Bank yielded no commercial quantities of ocean perch. During the two cruises (cruise 24--5 days; cruise 25--16 days), 32 tows in the midwater area from near the surface to depths of 228 fathoms failed to produce fish though indications were that the Service's nylon and manila midwater trawls were working satisfactorily.

During the cruises considerable time was spent searching for midwater schools of fish, but no indications of fish in midwater were obtained by the two electronic fish-finding devices installed aboard the Delaware. Previous experience has shown that unless the echo-sounding or fish-finding devices record concentrations of fish or other marine life in the midwater areas, the chances for successful catches in midwater are very slight.

On three short tows the midwater trawl was intentionally set on the bottom. One tow caught 350 pounds of ocean perch and a few cod and gray sole. Midwater trawling in the same area during day and night yielded no ocean perch. Two other bottom sets caught small quantities of northern shrimp (Pandalus borealis).



M/V Delaware Cruise 25 (Aug. 13-Sept. 6, 1956).

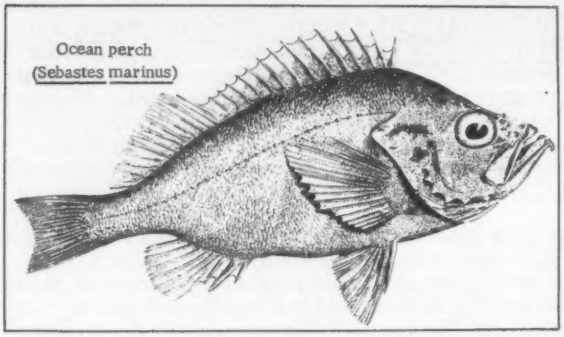
Two midwater trawls of different designs were used during the cruises. One, an all-nylon net of $4\frac{1}{2}$-inch mesh in the wings, 3-inch mesh in the cod end, and a 50-foot square mouth opening. The second net, all manila, 6-inch mesh wings, 3-inch mesh in the cod end, and a 65-foot square mouth opening. Side-setting midwater trawl gear presented problems, but after modifications of the net and doors the gear was operated successfully.

The electronic depth telemeter was used on all midwater tows and allowed for accurate depth-positioning of the midwater net. This prototype instrument developed for the Service by the University of Miami Marine Laboratory has proved to be very serviceable.

Deep-water exploratory trawling for ocean perch along the edge of the continental shelf south of Georges Bank was to be the objective of the Delaware during an 11-day trip scheduled to begin September 25, 1956. The area from 100 to 300 fathoms will be explored by the Delaware, principally in locations where possible commercial concentrations of ocean perch were indicated during recent cruises for deep-water lobster. Two types of nets were to be used, a standard #41 and a "balloon" trawl. Several tows were to be made using a 16-tooth rocking chair-type dredge in the shallower areas of Georges Bank as limited preliminary exploratory work on the commercial possibilities of an offshore shellfish resource.

North Atlantic Fisheries Investigations

BIOLOGISTS TAG FIRST OCEAN PERCH: Due to a strange occurrence of deep-sea ocean perch near the surface at Eastport, Me., biologists from the Woods Hole Laboratory of the U. S. Fish and Wildlife Service were able to initiate a successful tagging program early in August. Numbered plastic discs were inserted on the cheekbones of 317 fish in the first phase of the program.



Ocean perch normally occur in depths of 40-200 fathoms, and are fatally bloated when brought to the surface as a result of the extreme change in pressure. Consequently, no fish can be tagged which are caught by commercial trawlers. The biologists have been considering various schemes for tagging the fish without bringing them to the surface, such as the use of detachable marked hooks. Before embarking on a program involving complicated procedures, however, they decided to investigate persistent rumors that ocean perch occur near the surface in late summer at Eastport, Me.

A check at this locality revealed hundreds of ocean perch feeding at or near the surface on the small pelagic shrimp Meganyctiphanes. In three days of hook-and-line fishing 317 fish were tagged. The fish were in excellent condition when released and were at or near commercial size so there is every reason to believe some recoveries will be made provided this stock of fish moves into commercial fishing grounds later in the year. The biologists will continue their work until thousands of fish have been tagged.

Fishermen are urged to look for tagged ocean perch. The tag is a brilliant yellow disc pinned through the gill cover on the left side of the fish. The fish as well as the tag should be saved if possible. Any Fish and Wildlife agent may be notified upon capture of such a fish. A reward will be paid.

Recoveries of marked fish will provide important information on the growth rate, mortality rates, and migrations of this valuable food fish in the North Atlantic.

* * * * *

MATERIALS FOR GROUNDFISH FOOD HABITS STUDY COLLECTED BY M/V "ALBATROSS III" (Cruise 80): To collect materials on Georges Bank for a study of the benthic fauna and the food habits of groundfish was the purpose of cruise 80 (August 9-17) of the Service's research vessel Albatross III.

Bottom fauna samples and stomachs from groundfish were obtained at seven widely-spaced locations on or adjacent to Georges Bank. The areas represented were: Southwest Part, Southeast Part, Northeast Peak, Northern Edge, Central Georges, Georges Basin, and South Channel. Fish were taken with a No. 36 otter trawl fitted with a $\frac{1}{4}$-inch (expansion measure) mesh liner. Haddock, cod, butterfish, whiting, herring, and red hake were the principal species caught. A few specimens of 13 other species were taken. Stomachs from all species were dissected out and retained for study.

Service's research vessel Albatross III.

The sedentary and slow-moving bottom organisms were taken by means of the Smith Sampler, Digby scallop drag fitted with a fine mesh liner, and a sled-mounted ring net. All collections were preserved and brought to the laboratory for analysis.

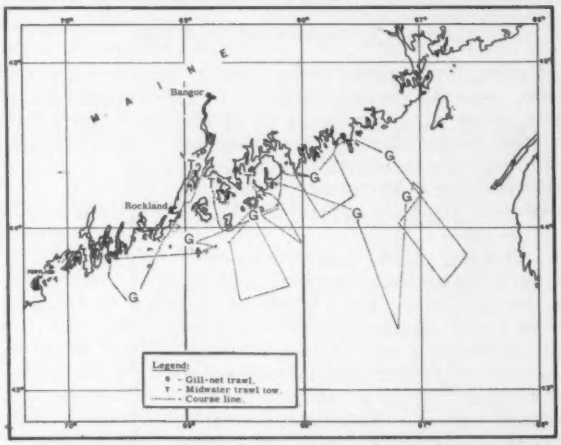
The analysis of these samples will be made to determine whether or not haddock are selective in their feeding and to determine the relationship of food organisms to the distribution of haddock.

The vessel's next cruise will start September 14. On this trip the 1956 survey will be made to determine the extent and distribution of the new haddock year-class (1956) on the bottom.

North Atlantic Herring Research

COASTAL WATERS OF EASTERN GULF OF MAINE EXPLORED FOR HERRING BY M/V "METACOMET" (Cruise 5): Scouting and fishing the coastal waters of the eastern part of the Gulf of Maine to learn if herring (particularly of sardine size) were present at this time was the principal purpose of Cruise 5 (August 1-10, 1956) of the M/V Metacomet, a Fish and Wildlife Service chartered exploratory fishing vessel.

Results of the cruise were largely negative. Only very small catches of herring were made in herring gill nets. Three different methods of setting gill nets were used: (1) "anchored sink gill nets" set on the ocean bottom; (2) "anchored floating gill nets" which were suspended 12 feet deep from large surface floats but held in a fixed position by anchors at each end; and (3) "drift gill nets" which were suspended 12 feet deep from surface floats, drifting freely during the night with one end attached to the drifting Metacomet. Herring brit were located on the depth-sounder and sampled in Blue Hill Bay and Penobscot Bay on August 8 and 9 when weather prevented setting gill nets in outside waters.



Cruise 5 of Fish and Wildlife Service chartered vessel Metacomet.

Cruise No. 6 of the Metacomet was scheduled for August 17 through 27. The objective is to make a thorough survey of the inside waters along the Coast of Maine from Passamaquoddy Bay to Casco Bay for 0-year-class herring "brit" which may become available as sardines during the autumn months. The depth-sounder will be used to locate fish and midwater trawl gear will be used for fishing.

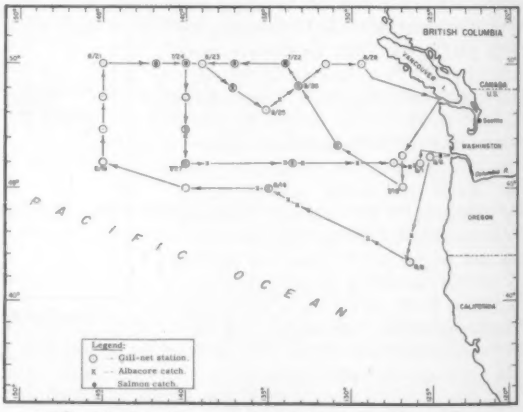
North Pacific Exploratory Fishery Program

ALBACORE TUNA AND SALMON DISTRIBUTION IN OFFSHORE WATERS STUDIED BY "JOHN N. COBB" (Cruise 28): Distribution of albacore tuna and salmon in offshore waters from northern California to southern British Columbia was investigated during a 7-week cruise by the Service's exploratory fishing vessel John N. Cobb, which returned to Seattle on August 30.

The Service's research vessel John N. Cobb.

Results of the exploratory fishing with surface gill nets and trolling gear showed that albacore were widely distributed off Oregon and Washington from 80 to 600 miles offshore. Salmon were caught offshore only at four gill-net stations along 50° N. latitude, and none were taken south of this line except for one silver salmon caught on albacore trolling gear about 20 miles off the Columbia River. No albacore were caught north of 49° 06' N. latitude.

Following a prearranged schedule to insure adequate coverage of the area, the vessel completed 27 nighttime gill-net stations out to 145° W. longitude, over 800 miles offshore. The standard set was 900 fathoms of nylon gill net with mesh sizes from $3\frac{1}{4}$ to $8\frac{1}{2}$ inches. Surface trolling with 6 or 7 lines was conducted during daylight hours while running between stations. Significant fishing results were transmitted to the fishing fleet by radio.



M/V John N. Cobb, Cruise 28 (July 16-August 30, 1956).

A total of 63 albacore were caught, 38 on trolling gear and 25 in the gill nets. Individual catches were small during the entire cruise, indicating that no sizable concentrations of either albacore or salmon were available at the time in the waters fished. No schools of either species were seen. The first catch of albacore was made in gill nets July 20 near the Seamount about 270 miles west of Grays Harbor. Best albacore catches were made on July 29 when nine fish were taken trolling near 46° N., 134° W. and nine were caught in the gill nets that night about 20 miles eastward. Five red salmon and two silver salmon were caught at four of the northernmost gill-net stations. One steelhead trout was taken along with 2 red salmon in the gill nets on July 22 at 50° N., 133° 58' W.

Several other species of fish, mostly jack mackerel, pomfret, and blue shark were present in most gill-net catches. Up to 206 pomfret, 148 jack mackerel, and 31 blue shark were taken in individual catches. On July 27, the gill nets caught 97 large squid from $2\frac{1}{2}$ to 3 feet in length at 46° N., 140° W. Night-light fishing produced numbers of small squid, saury, and lantern fish, all important items of albacore food in these waters.

The John N. Cobb's work was coordinated with a cruise of the University of Washington's oceanographic research vessel Brown Bear, and the two vessels worked in close conjunction much of the time. Simultaneously the John R. Manning from the Pacific Oceanic Fisheries Investigations conducted albacore research west of 145° W. longitude, adjoining the area covered by the John N. Cobb. Oceanographic and biological data will be compared with the fishing results to learn as much as possible of the movements and other habits of albacore, how they are affected by changes in the ocean, and why their availability to the fishermen fluctuates so greatly.

Following the early albacore catches by the John N. Cobb and the Brown Bear, the commercial fleet in mid-August found schools of albacore close-in to the Oregon coast, and good fishing was reported by a number of vessels. This is the first year since 1950 that any appreciable numbers of albacore have been caught north of California.

Oysters

SUMMER 1956 SET IN CHESAPEAKE BAY AREA: Each season records of the time and intensity of oyster setting and of the attachment of fouling organisms in certain areas are obtained by the Chesapeake Biological Laboratory of Maryland's Department of Research and Education, through exposure of test shells. Experience has shown that hardly ever does the first oyster spat of the season appear before the first of June and none have been recorded later than the month of October. Hence, at most stations where the time and setting rate of spat are measured, shells are exposed only during the above period.

A few scattered spat were attached to shells at most stations during the first part of this summer. Usually a peak of setting occurs in certain areas in late June or July, sometimes followed by one or more later peaks. At some stations, especially in the Solomons area, the light set occurs most often during the fall. St. Marys River, the upper Honga River, both sides of the Bay just above Solomons, and the Patuxent River all had received only a few scattered spat this year from early June to mid-July although the first named areas usually have good accumulations by that time. Scattered data indicate that little set occurred during this same period in Holland Straits and Piney Island Swash. Smith Creek, however, produced a fair set during the week of June 28-July 5 that amounted to about 10 spat per shell face. This rate of setting had diminished to very few spat during mid-July.

Even an initial set of ten or more spat per shell face at an age of one week does not insure that many will survive the perils of a microscopic oyster's early life.

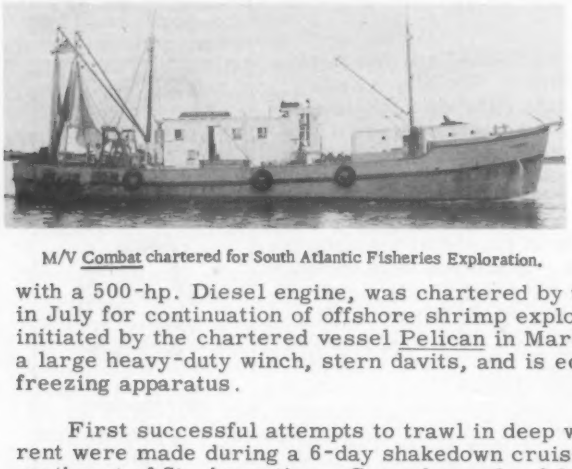
Shells that have been planted for a longer period prior to the set may also be quite foul and so offer little suitable space for spat attachment. Of course, when only a few spat attach initially, the number of surviving set must remain small. Typically, light sets, such as have occurred so far this season, show a much better rate of survival than do more densely-crowded sets. It is still too early to predict just how successful this season's oyster set may be, for later peaks of more intensive setting may occur. Only Smith Creek so far has had enough potential spat-fall to produce a good crop if commercially planted shells were clean and the rate of survival high.

While the amount of spat found on clean test shells exposed each week does not give an accurate picture of the crop to be found on commercially-planted shells by late fall, it does offer a means of getting the maximum possible attachment from the set that occurs. Experiments have shown that shells planted just prior to a peak of oyster setting sometimes may obtain two or more times as many spat as shells that have been overboard for several weeks prior to the set. This is due to the shell's cleaner surfaces at the time of spat-fall. In some areas a heavy wave of barnacle setting often occurs in late spring or even in early June that can render shells almost useless for spat attachment when the oyster set occurs.

A number of years of observation in a given area sometimes may reveal a rather consistent pattern of oyster setting so that a normal date can be picked when shell planting may be done only a short time before the oyster setting peak is most likely to occur. Observations by test shells also may reveal places that seldom obtain significant sets at any season and others that usually produce a high rate of setting. Some use of such observations has been made in shell planting, but in large-scale operations it is not always possible to get all of the shells over at the optimum time even when this is fairly well designated, the July-August 1956 Maryland Tidewater News points out.

South Atlantic Exploratory Fishery Program

ROUND-THE-CLOCK TRAWLING BY M/V "COMBAT YIELDS EXCELLENT CATCHES OF RED SHRIMP (Cruise 4): Round-the-clock trawling by the M/V Combat off St. Augustine in depths of 175 to 210 fathoms yielded excellent catches of deep-water red shrimp (Hymenopenaeus robustus). A total of 4,200 pounds of heads-on shrimp (21 boxes, headless) were caught in 16 drags, using a 40-foot flat trawl. Twenty-two drags of 3- to 4-hour duration were made during a 4½-day fishing period. Six of these tows failed to reach bottom, and no catch was made.



M/V Combat chartered for South Atlantic Fisheries Exploration.

The M/V Combat, a 96-foot wood hull shrimp vessel powered with a 500-hp. Diesel engine, was chartered by the U. S. Fish and Wildlife Service in July for continuation of offshore shrimp exploration along the South Atlantic coast initiated by the chartered vessel Pelican in March 1956. The Combat is rigged with a large heavy-duty winch, stern davits, and is equipped with immersion-type shrimp-freezing apparatus.

First successful attempts to trawl in deep water against the Gulf Stream current were made during a 6-day shakedown cruise, July 26-31, on smooth bottom southeast of St. Augustine. Ground speeds of 2.5 to 3.5 knots were determined to produce the best fishing results while towing countercurrent. A minimum ground speed of 4 to 4.5 knots can be obtained towing with the current.

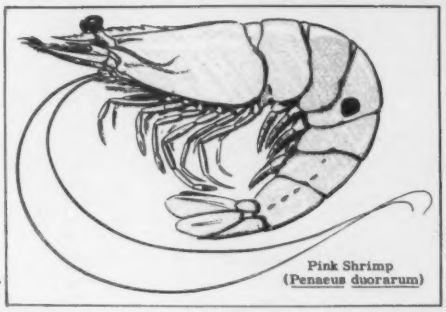
The subsequent round-the-clock fishing (August 6-11) was confined to an area off St. Augustine where previous work by the M/V Pelican revealed promising concentrations of red shrimp. Drags were alternately run with the current and countercurrent. The best catch yielded 560 pounds of shrimp, from a 4-hour countercurrent drag. The remaining 15 successful drags caught from 200 to 450 pounds of heads-on shrimp. The catch averaged 25 count headless.

Highest concentrations were found immediately below 29° 58.5' north latitude, in 175 to 190 fathoms. To the north of this point rock and coral bottom constitute a major trawling hazard.

The Combat is scheduled to depart Jacksonville on August 14 to continue fishing operations in the same general area. During this trip 80-foot balloon trawls will be used to obtain information on potential commercial catch rates. Also, a series of exploratory drags will be made between the 10- and 50-fathom curves southeast of Mayport, to determine the extent of offshore movement of brown shrimp stocks presently being fished in that area.

* * * * *

EXPERIMENTAL SHRIMP TRAWLING IN KEY WEST-TORTUGAS AREA BY "GEORGE M. BOWERS" (Cruise 6): Small amounts of pink shrimp (Penaeus duorarum) were taken fishing just off the bottom, and trace amounts in three midwater tows by the Service's gear research vessel George M. Bowers during a 15-day experimental shrimp trawling cruise in the Key West-Tortugas area off southern Florida. The vessel, which completed its trip on August 30, made 50 drags of one to three hours with 40-foot and 20-foot flat trawls on the bottom, off the bottom, and in midwaters.



Pink Shrimp (Penaeus duorarum)

Ten drags fishing on the bottom among boats of the fleet in 11- to 20-fathom depths resulted in catches ranging from individual shrimp to 10 pounds (heads off) an hour. Fishing in the same area with the trawl rigged to fish 2-2½ feet off the bottom resulted in catches ranging from individual shrimp to three pounds an hour.

Fishing off the bottom was also conducted in bad bottom areas known as "The Loggerheads," in depths of 11 to 30 fathoms. Ten tows were completed in this area with catches ranging from individual shrimp to two pounds an hour. Larger individual shrimp were taken in the deeper waters (23 to 30 fathoms) with individuals ranging from 6 count to 20 count. On five additional tows quantities of sponge and invertebrates (to 200 pounds) were taken in bad bottom areas when the net touched bottom. Gear damage was slight.

A total of 25 tows were made with 40-foot and 20-foot trawls in midwaters at distances ranging from 2 to 5 fathoms above the bottom in depths ranging from 11 to 30 fathoms. One, two, and three individual pink shrimp (16-20 count, heads off) were taken on three tows with the trawl a calculated two fathoms above the bottom. These tows were made just northeast of Tortugas in 16 to 17 fathoms of water.

Two biologists from the University of Miami Marine Laboratory participated in the cruise for continuation of cooperative experiments with trawl savings gear. Studies are being conducted to test the survival of shrimp escaping through cod-end meshes in the Tortugas fishery. Shrimp caught in the cod-end cover bags were held in aquaria aboard the research vessel to determine extent of injury in escapement through meshes. Results of the tests will be announced by the Marine Laboratory when analysis has been completed.

South Carolina

OYSTER LAWS REVISED: Oyster law revisions by the last General Assembly of South Carolina present new opportunities for profit, while promoting the growth of the oyster industry, in the opinion of the Chairman of the State's Wildlife Resources Commission.

The new oyster code repealed 24 sections and amended 14 more into a compact 20-section body of law, points out the summer 1956 issue of South Carolina Wildlife.

Perhaps the most important features of the revision are these:

1. Owners and lessees of oyster bottoms are encouraged to improve their beds because the new law protects the oysters from public harvest. As the law stands now, an owner or lessee need only post his oyster beds as prescribed in the statute to make it illegal for persons to enter upon and harvest without authority. Penalties are provided for violations.

2. Formerly, the "two-bushel law" allowed anybody to take oysters freely even from private beds upon which owners or lessees had spent money and effort in propagation and cultivation. Now, the Wildlife Resources Commission (through the Division of Commercial Fisheries) is directed to establish and maintain "oyster farms" in each of the six coastal counties. From these beds the public will be entitled to gather oysters free for their own use.

3. Seed oyster production, made legal by the new law, should become profitable rapidly for two reasons. One is that seed oysters may be grown on beds now barred to use because of pollution. Seed oysters must be taken up and transferred to other beds by the time they are 1½ inches long. Thus, they will cleanse themselves long before they reach marketable size. Oyster shores, especially around Charleston and Beaufort, have been seriously curtailed by pollution. This will put them back to profitable work. Moreover, there is a serious and growing need for new seed oyster sources for Chesapeake Bay and Long Island waters. South Carolina is capable of producing two crops of seed oysters every year.

4. The rights of landowners adjacent to oyster beds not under lease to preference in leasing now is limited to two acres each. Formerly, there was no limit specified.

5. A new leasing right up to four acres was instituted for persons or corporations not engaged in commercial oyster culture.

6. Lessees must show by the end of three years that they have "Effectively cultivated the area or face forfeiture of the lease, after due notice and a hearing."

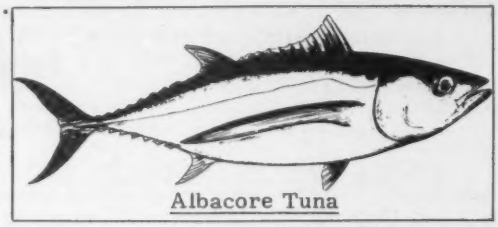
Tuna

ALBACORE BEING SOUGHT OFF OREGON-WASHINGTON COAST: "We ran into some fish but not in concentrations heavy enough to support a commercial fishery," reported one of the two Oregon Fish Commission biologists who have been aboard the Brown Bear, University of Washington oceanographic research vessel, for the past three weeks in a large-scale search for albacore tuna off the Oregon-Washington coast. The Brown Bear and a companion vessel, the John N. Cobb, exploratory fishing vessel operated by the U. S. Fish and Wildlife Service, were in Astoria on August 3 for a brief pause in a seven-week hunt for albacore and facts that may influence the distribution of these fish in Northwest offshore waters.

In all, 72 albacore were caught by the two ships during this first phase of the cruise--28 by the Brown Bear and 44 by the John N. Cobb. All fish caught by the Brown Bear were taken on feathered jigs, but the John N. Cobb took 20 tuna with gill nets. Most of the albacore were caught from 300 to 400 miles offshore. When albacore supported a substantial commercial fishery off Oregon between 1938 and 1950, the fish were caught in large numbers as close as 50 miles off the coast. Oregon's albacore catch hit a peak of 22.5 million pounds in 1944.

The Fish Commission biologist said food fish and plankton utilized by albacore were fairly abundant but were found in widely scattered groups. Considerable numbers of mackerel-like sauries, regarded by biologists as a prime item on the albacore menu, were sighted during the cruise.

Both vessels departed from Astoria August 6 for the second lap of the investigation in open waters off southern Oregon and northern California. The prospects for locating larger schools of albacore appear to be better for this leg of the trip because:



Albacore Tuna

1. Another U. S. Fish and Wildlife Service research vessel, the John R. Manning, caught over 30 albacore in the general vicinity last year.
2. The Brown Bear and the John N. Cobb will be fishing in waters closer to areas where albacore are regularly taken in commercial quantities.
3. Biggest albacore catches were made in August when a fishery existed off Oregon and Washington.

The research vessels plan to continue to maintain radio contact with commercial fishing vessels and relay any news of sizable schools of albacore that might be encountered. A total of over 3,500 miles will be covered during this summer's albacore investigation which has been coordinated by the Pacific Marine Fisheries Commission.

United States Fishing Fleet[1/] Additions

JULY 1956: First documents as fishing craft were issued for 68 vessels of 5 net tons and over during July 1956, according to the Bureau of Customs. This was 15 vessels more than for the same month of 1955. The Chesapeake Bay States led

Table 1 - U. S. Vessels Issued First Documents As Fishing Craft, by Areas, July 1956 and Comparisons

Area	July		Jan.-July		Total
	1956	1955	1956	1955	1955
	(Number)				
New England	1	5	10	15	18
Middle Atlantic	4	-	19	9	13
Chesapeake	23	3	66	27	54
South Atlantic	12	10	61	40	65
Gulf	10	7	65	55	103
Pacific	14	26	62	86	117
Great Lakes	-	-	2	5	9
Alaska	4	2	31	25	35
Hawaii	-	-	-	2	3
Virgin Islands	-	-	-	-	1
Total	68	53	316	264	418

Note: Vessels assigned to the various sections on the basis of their home port.

Table 2 - U.S. Vessels Issued First Documents as Fishing Craft, by Tonnage, July 1956

Net Tons	No.
5 to 9	31
10 to 19	14
20 to 29	8
30 to 39	3
50 to 59	2
100 to 109	1
110 to 119	1
120 to 129	4
130 to 139	1
150 to 159	2
180 to 189	1
Total	68

1/ Includes both commercial and sport fishing craft.

with 23 newly-documented craft, followed by the Pacific area with 14, the South Atlantic with 12, the Gulf with 10, and the Middle Atlantic area and Alaska with 4 each. New England was credited with 1 newly-documented vessel.

The Chesapeake Bay area showed the greatest increase in vessels issued first documents during July 1956 with 20 vessels more than were reported for July 1955. The South Atlantic and Gulf also had increases while the Pacific area showed a decrease of 54 percent as compared with the same month in 1955.

During the first seven months of 1956, a total of 316 vessels was documented for the first time as fishing craft--52 more than the number reported for the same period of 1955. This represents an increase of 20 percent.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MAY-JUNE 1956: United States imports of edible fresh, frozen, and processed fish and shellfish in June rose 3.2 percent in quantity and 13.9 percent in value as compared with May 1956. Compared with June 1955 the imports for June 1956 decreased 5.0 percent in quantity, but were 8.2 percent higher in value. June 1956 imports averaged 33.7 cents a pound as compared with 30.0 cents a pound for the same month in 1955 because there were more imports of canned salmon, canned lobster and spiny lobster meat, and canned crab meat.

United States Foreign Trade in Edible Fishery Products, May-June 1956 with Comparisons

Item	Quantity					Value				
	June		May		Year	June		May		Year
	1956	1955	1956	1955	1955	1956	1955	1956	1955	1955
	(Millions of Lbs.)					(Millions of $)				
Imports:										
Fish & Shellfish:										
Fresh, frozen, & processed 1/	58.4	56.6	56.6	57.1	769.9	19.7	17.3	17.3	17.1	206.4
Exports:										
Fish & Shellfish:										
Processed 1/ only (excluding fresh & frozen)	6.5	3.6	4.7	7.9	91.0	1.3	0.9	0.9	1.4	21.6

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

Imports of edible fresh, frozen, and processed fish and shellfish in May 1956 decreased about 15.5 percent in quantity and 2.3 percent in value as compared with April 1956. Compared with May 1955 the imports for May 1956 decreased one percent in quantity, but were 1.2 percent higher in value. The dollar value in May 1956 was close to 30.6 cents a pound, compared with 29.9 cents a pound in May 1955. The higher valuation in May 1956 compared with May 1955 was probably due to increases in the imports of canned salmon and crab meat which have a high dollar value.

Exports of processed fish and shellfish in June 1956 rose almost 38 percent above the previous month and 81 percent above the same month in 1955. The July 1956 value of these exports kept pace with the increase in quantity and went up 44 percent as compared with the previous month and the same month a year earlier. Increased exports of canned sardines were principally responsible for the spurt in processed fish and shellfish exports.

Exports of processed fish and shellfish in May 1956 increased about 24 percent from the April 1956 total, but were down 41 percent from May 1955. The value of exports in May 1956 increased 13 percent when compared with April 1956 but was 36 percent below May 1955.

* * * * *

GROUNDFISH FILLET IMPORTS DROP 6 PERCENT IN AUGUST: Imports of groundfish (including ocean perch) fillets during August 1956 of 11.3 million pounds were 6 percent less than the 12.0 million pounds imported during the corresponding month of last year. The drop, which was caused primarily by less imports from Canada, offset the 1.7-million-pound increase from Iceland. Imports from Denmark, the Netherlands, West Germany and Miquelon and St. Pierre were also somewhat larger.

Canada continued to lead all other countries exporting groundfish fillets to the United States with 8.6 million pounds during August 1956--76 percent of the total groundfish fillet imports during the month.

Total groundfish and ocean perch fillet imports into the United States during the first eight months of 1956 amounted to 93.9 million pounds as compared with 87.3 million pounds during the same period of 1955. Canada, with 68.1 million, led all other countries exporting fillets to this country during that period, followed by Iceland (17.4 million pounds), and West Germany (1.7 million pounds).
Note: See Chart 7 in this issue.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-JUNE 1956: Fresh and frozen tuna imports for the first six months of 1956 totaled 67.1 million pounds, 8 million pounds less than in the same period of 1955. Albacore tuna imports during this period amounted to 20.7 million pounds as compared with 34 million pounds in the first six months of 1955. "Other tuna" imports totaled 46.6 million pounds, a gain of 5.3 million pounds over the same period in 1955. This year Japan shipped in considerably more frozen "other tuna" than last year, while Peru shipped in substantially less.

Canned tuna imports for the first six months of 1956 reached 18.2 million pounds, about 4.3 million pounds more than in that period of 1955. Canned bonito imports of 8.2 million pounds during the first six months of 1956 were 1 million pounds less than in the same period of 1955.

Canned salmon imports during January-June 1956 totaled 11.1 million pounds while in the first six months of 1955 only 1.2 million pounds were imported.

Canned sardine imports for the first six months this year totaled 9.1 million pounds as compared with 10.4 million in the comparable period of 1955.

Fresh and frozen salmon imports for the first six months of 1956 amounted to 2.4 million pounds, 3.1 million pounds below the same period of a year ago.

Shrimp imports (fresh, frozen, canned, and dried) for the first six months of 1956 amounted to 31.9 million pounds, an increase of 11 million pounds over the same 1955 period. Imports from Mexico, Panama, Ecuador, and Japan were up.

Fresh and frozen lobster and spiny lobster imports for the first six months of 1956 amounted to 27.8 million pounds as compared with 26.9 million pounds for the same period a year earlier. Canned lobster imports for the first six months of 1956 of 1.8 million pounds were less than the 2.0 million pounds imported in the same period of 1955.

Canned crab meat imports for the six months of 1956 of 2.6 million pounds were almost a million pounds greater than for that period of 1955.

Groundfish fillet (including blocks and slabs) imports for the first six months of 1956 amounted to 63.4 million pounds, compared with 61.4 million pounds for the similar period a year ago. Of the total, fillet blocks and slabs imported during the first six months of 1956 amounted to 15.4 million pounds, over 10 million pounds less than for the like period of 1955.

Other fillets than groundfish imported during the first six months of 1956 totaled 29.3 million pounds, compared with 27.5 million pounds in the 1955 period with the principal gain in flounder and fresh-water fish fillets.

Fish meal imports January through June 1956 reached 59,726 tons as compared with 55,267 tons for the comparable period of 1955.

Canned salmon exports for the first six months of 1956 were 0.7 million pounds as compared with 4.4 million pounds in that period of 1955.

Canned sardine exports for the first six months of 1956 reached 22.7 million pounds, a gain of 2.4 million pounds over the similar period of 1955.

Fish oil exports January through June 1956 of 63.1 million pounds were much greater than the 46.0 million pounds in the like period of 1955.

Wholesale Prices, August 1956

Landings of fish and shellfish in August 1956 were at about the same level as the previous month, but demand was only light to moderate in spite of the cool weather which prevailed in most marketing areas. Higher wholesale prices during the month for fresh dressed finfish were offset by lower prices for fresh and frozen processed and canned fishery products. The August 1956 over-all wholesale index (114.6 percent of the 1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned) was the same as the previous month, but 2.6 percent higher than in the same month in 1955.

General view of one of the sheds in Fulton Fish Market, New York City on a Friday morning after most of the selling activity is over. Barrels in foreground are ready for loading and shipping out.

Fresh fish landings, which were light in July, continued light in August in most fishing areas. All drawn, dressed, or whole finfish items included in the index were priced substantially higher in August 1956 than in the previous month, particularly (1) fresh large drawn haddock because of lighter landings, (2) fresh dressed halibut because of evenly-distributed landings on the West Coast and a good demand, and (3) fresh king salmon because catches were light in the Pacific Northwest. Compared with the same month (hurricanes on East Coast) in 1955, wholesale prices this August for fresh drawn haddock were 39.5 percent lower at Boston and for whitefish were substantially lower at New York City and Chicago; but higher prices prevailed for fresh

halibut, fresh king salmon, and yellow pike at New York City, and lake trout at Chicago. The drawn, dressed, or whole finfish subgroup index in August 1956 was up 7.1 percent from the previous month, but down 4.0 percent from August 1955.

More plentiful supplies of small haddock were responsible for the drop in prices from July to August 1956 for fresh haddock fillets at Boston (down 13.6 percent) and fresh large shrimp at New York City (down 12.9 percent). Compared with August 1955, lower prices this August for fresh haddock fillets were more than

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1956 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ ($)		Indexes (1947-49=100)			
			Aug. 1956	July 1956	Aug. 1956	July 1956	June 1956	Aug. 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					114.6	114.6	109.7	111.7
Fresh & Frozen Fishery Products:					126.5	125.9	117.5	119.7
Drawn, Dressed, or Whole Finfish:					131.2	122.5	106.3	136.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.09	101.3	92.2	56.3	163.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.40	136.9	122.2	107.3	106.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.66	.64	148.3	142.7	144.4	135.4
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.49	.48	121.5	119.0	131.4	146.3
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.65	.65	131.4	131.4	139.5	171.8
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.60	.60	122.9	122.9	117.8	111.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.55	.54	129.0	126.7	78.6	119.6
Processed, Fresh (Fish & Shellfish):					122.2	128.6	127.7	107.3
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.29	.33	97.0	112.3	85.1	115.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.70	.80	110.2	126.4	129.3	98.0
Oysters, shucked, standards	Norfolk	gal.	5.75	5.50	142.3	136.1	136.1	117.5
Processed, Frozen (Fish & Shellfish):					114.5	117.7	112.1	99.3
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	103.4	102.1	102.1	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.28	.28	86.3	86.3	86.3	84.7
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.27	110.8	109.8	110.8	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.78	.82	120.4	126.6	116.1	94.1
Canned Fishery Products:					97.7	98.7	98.7	100.3
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.65	22.65	120.0	120.0	120.0	109.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.60	10.60	76.4	76.4	76.4	92.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.50	7.50	87.5	87.5	87.5	88.1
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	cs.	7.50	8.20	79.8	87.3	87.3	79.3

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

offset by higher prices for fresh shrimp and shucked oysters. The index in August 1956 for the fresh processed fish and shellfish subgroup was 5.0 percent below the previous month, but 13.9 percent higher than in the same month of 1955.

Moderate stocks and a steady demand stabilized frozen fillet prices in August 1956 at almost the same level as the previous month, but they were somewhat higher than in the same month a year earlier. On the other hand, an increase in the supply of frozen shrimp and a slight drop in demand caused shrimp prices to drop from July to August this year. However, frozen shrimp prices at Chicago were still 27.9 percent above August 1955. The frozen processed fish and shellfish subgroup index for August 1956 was down 2.7 percent from the previous month, but rose 15.3 percent above the same month a year ago.

The only significant change in canned fishery products prices occurred in canned Maine sardines which dropped 8.6 percent from July to August with the entry of the new pack into the market. As of the end of August, the pack of Maine sardines was almost 50 percent greater than the pack a year ago when conditions were far below normal. With the salmon pack this season substantially better than last season, prices were strengthening although the index did not record a rise in mid-August. Compared with the same month in 1955, prices this August were 9.5 percent higher for canned pink salmon and 0.6 percent higher for canned Maine sardines, but 17.2 percent lower for canned light-meat chunk tuna and 0.7 percent lower for California tomato-packed sardines. The August 1956 subgroup index for canned fishery products was 1.0 percent lower than the previous month and 2.6 percent below the same month a year ago.

BOOM IN PREPARED FROZEN FOODS

Prepared frozen foods now constitute more than a third of all frozen foods marketed in the United States, after a remarkable increase of nearly 50 percent last year. Manufacturers of these convenience foods look for a further substantial increase this year--perhaps 35 percent over the 1955 total.

Agricultural products have gained most in this relatively new field of merchandising, but the fishing industry has also chalked up an impressive record. Fish sticks sprang into national prominence two years ago following in the path of breaded shrimp. Other prepared fish specialty items soon appeared in grocers' display cases.

Housewives welcome the freedom from unpleasant odors and waste and the certainty of well-prepared meals without suffering the drudgery of a hot kitchen. So they are buying more and more of the many fine items of prepared frozen foods.

What is behind all this revolutionary change in marketing? The answer is advertising and promotion. Tempting color spreads in magazines arrest the attention and make fishery products ever so inviting, even to youngsters. Users of TV, radio, and newspaper advertising continually keep their products' merits before the consumers.

Those who pack these new prepared frozen food specialties have assumed a heavy responsibility to the consuming public. Most packers show a keen sense of awareness to the need for adherence to highest quality levels to insure repeat business. Government-sponsored voluntary standards of quality for fish sticks, which recently became effective, promise to exert a strong stabilizing influence in the sales of this product.

International

U. N. INTERNATIONAL LAW COMMISSION

CONFERENCE ON LAW OF THE SEA PROPOSED: A recommendation proposing the convening of an international conference of plenipotentiaries to examine most aspects of the law of the sea, and to draw up appropriate instruments on the subject, has been made by the U. N. International Law Commission.

The proposal is contained in the Commission's annual report, which this year completes the 15-member body's work of codifying the law of the high seas and of the territorial sea, a vast and complex task upon which it has been engaged ever since its first session in 1949. In 1954, the General Assembly asked the Commission to finish its work on the subject in time for consideration by the Assembly in 1956.

Among the questions dealt with in the 137-page report (Doc. A/CN.4/104) are: the breadth of the territorial sea; the "right of innocent passage," and the rights and duties of coastal states in that respect; the nationality of ships and whether there should be a special United Nations registration, entitling a vessel to fly the U. N. flag and to receive U. N. protection; penal jurisdiction in maritime collisions; the slave trade; pollution of the sea; and piracy, including piratical acts by aircraft, if these are directed against ships on the high seas.

Also included are revised sets of articles on fisheries and the conservation of the "living resources of the sea," and on the "continental shelf" and the right to explore and exploit its natural resources.

The proposal for calling an international conference is made in an introduction in which the Commission reaches the conclusion that this is the best way of giving "practical effect" to the rules it has formulated.

It recommends that the conference should be summoned by the Assembly, "to examine the law of the sea, taking account not only of the legal but also of the technical, biological, economic and political aspects of the problem, and to embody the results of its work in one or more international conventions, or such other instruments as it may deem appropriate."

The Commission goes on to express the belief that the conference should deal with all the different parts of the law of the sea covered in its present final report. Both its own experience, and the comments of governments, it says, have shown "that the various sections of the law of the sea hold together, and are so closely interdependent, that it would be extremely difficult to deal with only one part and leave the others aside."

The Commission adds that it considers the holding of the proposed conference "has been adequately prepared for" by its work to date. "The fact that there have been fairly substantial differences of opinion on certain points should not be regarded as a reason for putting off such a conference," it declares. In this connection,

it notes that there has been "widespread regret" that after The Hague Codification Conference of 1930, governments allowed "disagreement over the breadth of the territorial sea to dissuade them from any attempt at concluding a convention on the points on which agreement had been reached." "The Commission," it says, "expresses the hope that this mistake will not be repeated."

The Commission itself expresses the belief that international law does not allow the breadth of the territorial sea to exceed 12 miles. Up to that limit, however, it commits itself to no specific decision, saying that it considers this should be taken by the proposed conference.

It notes that the right to fix the breadth of the territorial sea at three miles, often regarded as "the traditional limitation," is not disputed, but adds: "As regards the right to fix the limit at between three and up to 12 miles, the Commission was obliged to note that international practice was far from uniform. Since several states have established a breadth of between three and up to 12 miles, while others are not prepared to recognize such extensions, the Commission was unable to take a decision on the subject, and expressed the opinion that the question should be decided by an international conference of plenipotentiaries."

The 25 draft articles on the Territorial Sea include a section on the right of ships to innocent passage, which provides that "there must be no suspension of the innocent passage of foreign ships through straits normally used for international navigation between two parts of the high seas."

Defining the meaning of the phrase "innocent passage," the report says: "Passage is innocent so long as a ship does not use the territorial sea for committing any acts prejudicial to the security of the coastal state, or contrary to the present rules, or to other rules of international law.

FOOD AND AGRICULTURE ORGANIZATION

EDIBLE FISH MEALS: Edible fish meals are helping to provide increased nutrition in the diets of mothers and children in many countries, especially in tropical regions. Such refined fish meals and fish flours are particularly useful for their protein value, low price, and ease of distribution and storage, while it is relatively easy to incorporate them in local traditional dishes and food preparations.

These are among the advantages claimed for fish meals specially refined for food, in a paper by the Nutrition Division of the Food and Agriculture Organization which was circulated during the recent Fish Processing Technologists Meeting at Rotterdam.

FAO is collaborating in the establishment of plants for the manufacture of edible fish meals and the United Nations children's welfare organization is urged to help governments to set up suitable plants.

Two types of potential consumers who would benefit from the supplementation of their diet with edible fish meals are those who prefer a mild, fresh-fish flavor or none at all--and those who prefer rather strong flavors, as they are used to consuming rather highly-flavored fish products such as fish pastes, sauces, etc., added to their otherwise rather bland diet, it is stated.

"In countries where the first of these preferences prevails, the fish meals to be introduced would resemble freshly dried or salted fish in taste and flavor, or they should be almost flavorless deodorized flours, which could conveniently be mixed with other foods such as bread flour.

"Where strong flavors are preferred deodorization or what may be called 'flavor refining,' would not be necessary. Any type of flour introduced should, however, resemble in its taste and flavor the local fish products to which people are accustomed."

Before an edible fish meal can be introduced into a specific area it is necessary to carry out "acceptability tests" to find out whether it can be

added to local dishes and consumed over prolonged periods without becoming objectionable. During recent years FAO has helped to arrange a number of such tests.

Preliminary tests are carried out, covering a limited number of people, often members of the staff of a research laboratory, to eliminate the fish meals that have no chance of acceptance and to work out recipes for the fish meals that seem likely to be acceptable. Tests follow on a larger scale, usually involving 50 to 200 children, in which an "enriched" food preparation, containing fish meal is given daily over 1-2 months. In some instances edible fish meals have been used in hospitals to test their effect on children under treatment for protein malnutrition.

"In general, the amounts of fish flour to be consumed daily by a child receiving fish flour as a protein-rich supplement may be from 10 to 15 grams (7 to 12 grams protein), comparable with 30 to 40 grams of skim milk powder (10 to 13 grams protein). These quantities of skim milk powder correspond with those provided in most U. N.-supported child-feeding programs.

To make fish meal suitable for human consumption it is necessary to eliminate fatty acids, peroxides, and other products to be found in some fish meals. Proper processing--in which high temperatures are avoided and exposure to air is mimimized--will prevent such changes to a large extent.

"The general bacterial count should be low, especially when the flours are consumed by children and, given normal processing this should not present difficulties. Deodorized fish flours can, if necessary, meet specifications calling for a total count of less than 2,000 bacteria per gram."

Fish meals to be used in supplementary feeding should have a protein content of not less than 65 to 70 digestibility coefficient and a high biological value. Relatively small quantities of fish meal protein with these characteristics can effectively supplement the proteins of the cereals which form the bulk of the diet of the poorer classes in many parts of the world.

"The fat content should preferably be low. Changes in flavor, and, in the case of deodorized meals, 'flavor reversion,' are mainly associated with the fatty constituent of fish meal preparations. Again, there is a slight possibility that harmful substances may be formed as a result of changes in the fat during processing and storage.

The price of fish meals must be low if they are to be of practical value as dietary supplements, it is stressed. It should be comparable, on a protein content basis, with that of dried skim milk. The manufacturing process must be such that the resulting product is of high nutritive value and harmless to the consumer. "It is essential that damage to amino acids should be avoided; this may easily occur if heating is prolonged."

"The paper goes on to give hints on the production of satisfactory nondeodorized edible fish meals. "Part of most of the fat present in the raw material must be removed, in accordance with the type of fish used for processing.

"In many countries meals containing 4 to 8 percent of fat might be satisfactory from the public health standpoint, if they are made from fresh sound fish with effective sanitary control and are stored in airtight or almost airtight containers for not more than a few months before consumption.

"As low a fat content as economically practicable is, however, to be preferred. Fat can be removed by solvent extraction. Experience has shown that repeated and prolonged treatment with solvents such as petroleum, benzine, and ethyl alcohol does not change biological value and digestibility to any significant extent."

Deodorized fish flours can be most easily made by treating minced wet fish directly, and it is sometimes economical and convenient to use high-grade fodder fish meals as raw material for refining, if these are acceptable from the hygienic point of view. It is, however, more difficult to remove unacceptable flavors from fish meals than from wet fish.

A fish flour plant which is planned for Chile will manufacture almost flavorless fish flour obtained for part of the year from wet fish (hake) and during other seasons from first grade meal of the fodder type based on hake and manufactured under satisfactory hygienic control. Benzine and ethanol will be used for removing the fat and deodorization and a temperature above 100 degrees C. will be avoided during the extraction process. The process and equipment to be used will be by a Swiss company. Other promising deodorization processes in an advanced stage are a German process, and a South African process developed by the Fisheries Industries Research Institute of South Africa. A Corporation in the United States has originated a process which produces a partly deodorized product, it is stated.

As to cost, it is declared that acceptable non-deodorized fish meals and flours can be produced at 18 cents a pound or below.

"However, it is probably more realistic to assume a cost price per lb. for deodorized fish flour of something between 23-45 cents a pound. The term 'deodorized' should not be taken to imply complete freedom from fishy flavors, but rather a degree of treatment which makes the flour acceptable for addition to appropriate foods in the diet."

Education of consumers in the practical use of fish meals will be needed if sales of the products are to expand, and the products must be available at a reasonable price, while potential markets seem to be considerable, says the paper.

"Non-deodorized meals may gain a market more readily than deodorized meals, at least in certain countries, since in many respects they resemble traditional fish products to which consumers are already accustomed."

Regarding further work on edible fish meals, the paper adds that basic work needed to evaluate promising processes and products will be carried on by FAO, but the whole problem of producing and utilizing edible fish meals, especially deodorized meals, is still in an early stage.

"There is room for much further development. Detailed research is needed on the processes of flavor removal and 'flavor reversion,' and on the influence of what may be called 'temperature time effects,' and other procedures used in manufacture on the nutritive value of the final product. Here there are considerable gaps in knowledge. The cooperation of research institutes in investigations of these and other problems is needed."

INTERNATIONAL CONGRESS ON CANNED FOODS

The Third International Congress on Canned Foods, organized by the International Permanent Committee on Canned Foods, was held September 24-28, 1956, in Rome and on September 29-30 in Parma, Italy. At Parma the Congress members visited the 11th Canned Food and Packaging Fair and attended a conference on machinery and equipment for the canning industries.

The purpose of the Committee is to promote the advance of scientific, technical, and practical knowledge useful to the canned food industry, and to develop the consumption of canned foods.

Included among the many subjects in the program were the following of value to fisheries interests:

Under "Current Problems in Canning Technology" was included the canning of fish.

Under "Containers" were included (1) corrosion of tin plate; (2) use of electrolytic tin plate; (3) choice of cans for various products.

Under "Sanitation" was included waste problems in the fish-canning industry.

Under "Bacteriological Problems" were included preserved and semipreserved fish.

(NORTH EUROPEAN) INTERNATIONAL FISHERIES CONVENTION

FIFTH MEETING OF PERMANENT COMMISSION: The Fifth Meeting of the Permanent Commission set up under the (North European) International Fisheries Convention of 1946 took place in London between May 8-11, 1956. Delegations attended from all 13 of the Member Governments, namely, Belgium, Denmark, German Federal Republic, France, Iceland, Ireland, Netherlands, Norway, Poland, Portugal, Spain, Sweden, and the United Kingdom of Great Britain and Northern Ireland. Observers were present from the Union of Socialist Soviet Republics, which was represented for the first time.

Attending the meeting also were observers from the International Council for the Exploration of the Sea, the Food and Agriculture Organization of the United Nations, and the International Commission for the Northwest Atlantic Fisheries, states a May 28 United States Embassy dispatch from London.

Much of the Commission's discussion was devoted to the report of an ad hoc Scientific Committee set up at the previous meeting to review available information and to advise the Commission on minimum mesh sizes for nets and minimum size limits for fish, and to say whether any changes were required. The Commission recognized that this report, the conclusions of which were based upon all the scientific knowledge arrived at after many years of fisheries research, was a most

important and valuable document. The Commission resolved to provide for the publication of the report, and it was agreed to recommend that the Member Governments should have the report translated for the information of their fishermen; should seek the views of their own fishing industries; and should report back with their recommendations and proposals by December 31, 1956. These will be taken into consideration, with the main report, at the next meeting. It was decided that in the meantime the 75-mm. (2.95-inch) minimum mesh for ordinary trawl nets should be continued for another year until April 4, 1958.

The Commission also gave further attention to the problem of mixed fishing for protected and for other species. The Commission appointed a Committee composed of representatives of the six countries most concerned (i.e. Belgium, France, Netherlands, Federal German Republic, Poland, and Sweden) to study this problem further for the next meeting.

Arrangements for insuring the uniform enforcement of the provisions of the Convention were again discussed. A committee of the Commission examined the reports of infractions submitted by all Member Governments and the Commission unanimously agreed to recommend to Member Governments suggestions designed to make more uniform enforcement possible. The Commission expressed its thanks to the Netherlands Government for making available an officer for the Commission's employment to visit those Member Countries which might so desire in order to advise upon the enforcement of the Provisions of the Convention.

Finally, the Commission received reports from the International Council for the Exploration of the Sea on the question of a definition of the light trawl, and the problem presented by the capture of undersized whiting in the industrial fisheries. The Commission decided to take no further action at present on these problems since the International Council was still continuing its investigations.

The Commission will hold its next meeting in London beginning on May 14, 1957.

MEDITERRANEAN FISHERIES COUNCIL

PROPOSES INVESTIGATION OF MEDITERRANEAN FISH MIGRATIONS: Renewed efforts to investigate the age-old riddle of the migrations and movements of fish in the Mediterranean, which have baffled man since the Phoenicians caught tuna along its shores, will be made if plans proposed by the General Fisheries Council for the Mediterranean are put into successful operation, a Food and Agriculture Organization news release of August 1956 points out.

The Secretary of the Council states: "The Council is promoting an ambitious program of investigation, depending, of course, on the help and cooperation of interested nations, which will entail the study of fish populations in the Mediterranean, the migrations and life cycles of various species of fish, a study of Mediterranean trawling grounds, and the accummulation of other knowledge which we hope will, in the long run, fit into place like pieces of a jigsaw puzzle, and give us a comprehensive view of fish stocks in the Mediterranean.

"It is a strange but true fact that although man has been fishing in the Mediterranean for thousands of years, we are to a great extent ignorant of what happens to some of the most important species of commercial fish. For example, we know that tuna appear in certain parts of the Mediterranean at certain times of the year, as they have done since the days of Nineveh and Tyre. Fishermen are able to fish them for only a few months then they completely disappear for the rest of the year.

"There have been, of course, many interesting theories as to where they go to but nobody has so far been able to clear up the mystery. We are faced with similar riddles in connection with other fish. If we could find the answer, we might be able to effect increases in fish production in the Mediterranean."

Asked what the General Fisheries Council for the Mediterranean proposed to do to try to solve the riddles of the disappearing fish, the Secretary explained that the Council, as a body, did not undertake investigations or research work. Its function was to promote cooperation in fisheries work between Mediterranean countries. There were a great number of problems of common interest which could be better tackled jointly by the nations concerned. The investigation of tuna, sardines, and other commercial fish, for example, could be better done if the nations agreed on a coordinated investigation program. In some cases even a cooperative program might be considered in which each nation could make a contribution.

"Although the Mediterranean has been fished since man first appeared in this part of the world," said the Secretary, "its fish stocks have always been relatively poor because food for fish is relatively scarce in the Mediterranean. But fish is an important part of the diet of a great number of the nations whose coasts border the Mediterranean, especially those with deserts and limited areas of arable land. These reasons make it all the more imperative that we should have the knowledge necessary to develop the fisheries and, in particular, the available fish resources.

"An interesting example of how a resource can exist undetected for thousands of years is to be found in the recent development of the Mediterranean shrimp fishery," stated the Secretary. "Shrimp fishing, up to recent years, was of little importance in the Mediterranean. Indeed, some people even believed that there were no worthwhile shrimp stocks. But now trawlers working from Algeria, Egypt, Italy, and Turkey are exploiting substantial stocks of large shrimp. The result has been the rapid development of a shrimp fishery, and a very profitable trade has been established in exports of shrimp to many European countries and the United States."

The General Fisheries Council for the Mediterranean was organized in 1950 under the auspices of the Food and Agriculture Organization of the United Nations and now has 11 members--Egypt, France, Greece, Israel, Italy, Monaco, Spain, Tunisia, Turkey, United Kingdom, and Yugoslavia. The activities of the Council are carried out through committees for exploration, production, utilization, inland waters, and statistics. The investigation of fishery stocks in the Mediterranean is only one item of the Council's program of work, and there are so many problems which urgently need attention that the Council has drawn up a priority list.

The current program includes mapping the quantitative distribution of fish eggs; determination of age and growth of fish; improvement of fishery statistics in Mediterranean countries; the bathymetric and geographic distribution of various species; the distribution, etc., of crustaceans; a study of Mediterranean trawling grounds; and a study of fishing methods and gear, which includes a classification of fishing boat gear and methods. There is also a whole range of work being planned under the heading of utilization, including transport and refrigeration of fish, fish meal, oil, byproducts, and canning, and so on. Another big field of work is concerned with inland-waters fisheries, the culture of fish in ponds, and the stocking and exploitation of barrage lakes and so on.

"The Council hopes shortly the Governments concerned will soon make a start on the study of trawling grounds," explained the Secretary. "This work will, of course, take years to complete. One aim is to make maps of all the fishing grounds being exploited and of those which can be fished by trawlers. It would be an advantage if such maps could give local names of the grounds, their size and the nature of the bottom and the characteristics of the animals living there, as well as the main species of fish and edible crustaceans caught in the locality. The maps could also give such information as the most favorable season for trawl fishing and the estimated average return of a boat of a certain type."

The size and scope of the work of the Council is indicated by the fact that at its third meeting, held at Monte Carlo, 54 technical papers were submitted by fishery experts. These have been published in a volume of "Proceedings and Technical Papers."

The next meeting of the Council was scheduled to be held at Istanbul, Turkey, September 17-22, 1956. "We have already an impressive list of technical papers to be presented at the meeting to which representatives of 18 countries and six international organizations have been invited, all of them particularly interested in the work being done to develop and improve fisheries in the Mediterranean," said the Council Secretary.

"Of course, much has been done by nations and organizations, especially under the aegis of the International Commission for the Scientific Exploration of the Mediterranean Sea, but even with that and future plans it will be many years before the full benefit of this new cooperative effort in fisheries will be felt in the Mediterranean. But we hope that the knowledge and understanding we gradually acquire should enable us one day to conserve and develop stocks so that the Mediterranean will yield more fish per year than it has done during any of the past two thousand or more years in which it has been fished."

WHALING

INTERNATIONAL WHALING COMMISSION EIGHTH ANNUAL MEETING: The International Whaling Commission began its Eighth Annual Meeting in London on July 16, and completed its deliberations on July 20, 1956.

All 17 Contracting Governments were represented at the meeting with the exception of Brazil. They comprised Australia, Japan, Denmark, France, Iceland, Canada, Mexico, The Netherlands, New Zealand, Norway, Panama, South Africa, Sweden, the U.S.S.R., the United Kingdom, and the United States, Italy and Portugal were represented by observers as were also F.A.O., the International Council for the Exploration of the Sea, and the International Association of Whaling Companies.

The Commission received from the Bureau of International Whaling Statistics at Sandefjord the catch figures for the past season. Nineteen factory ships with 257

catchers were engaged in the 1955/56 Antarctic season and the total catch by floating factories in the Antarctic increased from 2,061,789 barrels in 1954/55 to 2,134,012 barrels inclusive of sperm oil in 1955/56.

The chief object of the Commission is to arrange a balance between killing and replacement rates of the whale populations. To achieve this it sets limits upon the total catch. This limit takes into consideration the views of scientists upon the size of the stocks of whales and of the whalers on the economics of the industry. Scientific opinion in the Commission was almost unanimously in favor of a substantial reduction in the catch on account of evidence that the stock is declining. The existing catch limit is 15,000 blue-whale units. The Commission recommended that the catch for future seasons should not exceed 15,000 blue-whale units, and they recommended (but with one dissention--The Netherlands) that the limit should be reduced in the coming season (1956/57), to 14,500 blue-whale units.

It is not yet certain that next season's whale catch quota in the Antarctic will be reduced. If Netherland's opposition is followed by an official protest to the Commission within 90 days, the catch quota will have to remain at 15,000 units, in spite of scientists' warnings that whale stocks are being too heavily hunted.

The Commission was glad to note that in general there was a decrease in infractions over the previous year. They also received further confirmation from the Commissioner of the U.S.S.R. about the use of fenders of porous rubber which could replace the present use of whale carcasses for this purpose. The U.S.S.R. agreed to place at the disposal of the Commission full details of these fenders.

At present every factoryship is required to have on board two inspectors who are generally of the same nationality as the flag of the ship. The Commission, however, following the Seventh Meeting at Moscow in 1955, asked the United States to prepare a Protocol for the amendment of the Convention so as to permit consideration of a scheme to appoint independent observers in addition to the national inspectors. They have agreed to ask the Depository Government to take all possible steps to insure that the Protocol could be brought into force in time for the Commission to take action under its provisions at their Ninth Meeting. It is hoped that this Protocol may very soon be signed.

The Commission heard statements from the Commissioners for Norway and Panama about correspondence which has passed between their Governments on alleged infractions of the provisions of the Convention by a whale factoryship registered with the Panamanian Flag. This matter is still under discussion between the two Governments engaged in whaling.

The Commission decided that a Scientific Sub-Committee should again if necessary meet to consider certain scientific problems in anticipation of the 1957 Annual Meeting.

The 1957 Annual Meeting begins on June 24, 1957, in London, points out the August 3 issue of The Fishing News.

Algeria

CANNED SARDINE MARKET: The sardine industry in Algeria is not at present of any great significance in the economy of the country, states a July 3 dispatch from the United States Consulate at Algiers.

Production of canned sardines is declining, and the industry is in a state of crisis. A brief review of the canning industry's present position reveals the predominant influence of uneconomic practices by fishermen as well as the added difficulties imposed by the revolution.

Sardine production in Algeria amounted to 202,815 cases in 1955 (valued at about US$2.6 million) as compared with 428,800 cases in 1951 (valued at about US$5.5 million). The principal cause for the decline in production is the decrease in the amount and value of fish caught by Algerian fishermen who are prohibited by law from using large ring nets.

Table 1 - Algeria's Canned Sardine Pack, 1951-55

Year	Quantity	Value to the Canners (Not Including Taxes)	
	1,000 Cases	Million US$	Million Francs
1955 1/	203	2.6	912.7
1954 1/	245	3.1	1,101.1
1953 1/	299	3.9	1,354.3
1952	400	5.1	1,800.6
1951	429	5.5	1,929.6

1/ Includes the pack from imported frozen sardines.

Another reason for small catches over recent months has been the imposition of a curfew which prevents the fishermen from fishing all night. Due to the limitation on the use of nets, most fishermen have not invested in any large craft which would increase their range. The curfew has thus practically confined them to early evening fishing. In most of the fishing villages the curfew is 9 p.m.

Proposals originating primarily from the canning industry are now being put forward in the hope of encouraging an increase in the size of the sardine catch. Fishermen's organizations want to carry out an experiment during which they would be permitted to use ring nets; the catch would be sold to the factories for a guaranteed price; the factories would obligate themselves on the day preceding the catch to take a minimum amount of fish and the fishermen using the ring nets would withhold their catch from the fresh fish market. Economic circles express concern over the harm which would be done to fishermen if the present system were changed, although it is difficult to imagine how their situation could become more precarious. Le Messager, a commercial newspaper in Algiers, has actually proposed the institution of a special tax on sardines caught with ring nets to provide a fund for the rehabilitation of fishermen driven out of the business.

There were 53 factories canning sardines in Algeria in 1951. This number has been reduced to 40, and several factories are preparing to close in 1956. Some of the factories have maintained production by importing frozen sardines from French Morocco where there are no limitations on the use of nets. Despite these

Table 2 - Algeria's Imports and Exports of Canned Sardines, 1951-55

Year	IMPORTS			EXPORTS		
	Quantity	Value		Quantity	Value	
	1,000 Lbs.	US$1,000	Million Francs	1,000 Lbs.	US$1,000	Million Francs
1955	921	312	109.1	7,376	2,311	808.9
1954	350	125	43.8	10,180	2,757	964.9
1953	363	133	46.6	11,318	2,983	1,043.9
1952	296	102	35.7	16,566	4,225	1,479.0
1951	161	65	22.6	16,424	4,290	1,501.6

imports of frozen fish, Algeria's net exports of canned sardines have been declining at a rapid rate. The net export value amounted to US$2.0 million in 1955 as compared with US$4.2 million in 1951. The increase in imported sardines has been principally from French Morocco with France a close second. Most foreign brands of sardines sold in Algeria are actually imported from French distributors by Algerian merchants.

Domestic consumption estimated at an annual average of 30,000-40,000 cases, has remained relatively unchanged over the past five years. The native population provides the principal market for canned sardines. Although consumption by income group is not known, it is believed that the low-income native population consumes about 80 percent of the total.

The most popular size can is a flat can of $3\frac{1}{2}$ to 5 ounces. Another popular can is the $13\frac{1}{2}$-ounce oval can of pilchards which retails for about 29 U.S. cents. The most popular packing medium is a mixture of olive and peanut oils. Sardines packed in this medium are labeled, "Sardines a l' huile." Sardines packed in pure olive oil are so labeled and are sold at a slightly higher price. Tomato sauce is an unpopular medium for packing sardines.

The retail price of the $3\frac{1}{2}$- to 5-ounce flat cans varies from about 17-27 U.S. cents a can if the medium is olive oil and from 16-26 cents a can if the medium is a mixture of olive and peanut oils. The $13\frac{1}{2}$-ounce oval cans of pilchards retail at prices varying from 19-36 cents a can.

The opportunity for imports of canned sardines from the United States is extremely limited because local production meets consumption needs at the present level of prices. Third countries maintain exports of canned sardines to Algeria primarily by means of trade agreements with France. French bilateral trade agreements apply automatically to Algeria. The tariff on imported sardines is 95 percent ad valorem.

Imported sardines are normally distributed by importers direct to retailers or wholesalers. Domestic production is distributed by wholesale houses, although several factories carry out distribution direct to large retailers.

Note: Values converted at the rate of 1 franc equals US$0.00857.

Australia

ACT SETTING UP FUND TO DEVELOP FISHERIES PASSED: The Whaling Industry Act Repeal Act 1956, providing for the sale of the Government-owned Australian Whaling Commission's station at Carnarvon, Western Australia, to private operators, and the Fish Industry Act 1956, providing for a Fisheries Development Trust Account, were passed by the Commonwealth Parliament in May 1956. The Fish Industry Act 1956 which will be financed by the surplus which will arise from the sale of the Whaling Commission's business, will make possible the biggest move in Australia's history for the development of the nation's fishery resources, points out the (Australian) Fisheries Newsletter of June 1956.

Note: See Commercial Fisheries Review, August 1956, p. 63.

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CANNED SARDINE MARKET: One small firm in Albany, Western Australia, has on several occasions canned small amounts of pilchards. However, this firm has always used a tall round can for which there is practically no market. This firm canned 70 tons one season, but there has been no production the last two seasons. That is the extent of canning of sardine and sardinelike fish in Australia, states a July 16 dispatch from the United States Embassy at Canberra.

The Commonwealth Bureau of Fisheries reports that preliminary surveys indicate commercial quantities of pilchards are available on the coast of Northern New South Wales, Queensland, and parts of Western Australia. They plan to con-

duct a more detailed commercial survey this coming season. They believe that pilchards will develop into a commercial enterprise, but that the catch will be utilized for oil and meal rather than for canning purposes. There is a ready and quick market for meal and oil with a minimum of capital expenditure, whereas the cost of equipment and facilities for canning is prohibitive for the current market.

Table 1 - Representative Retail Prices of Canned Sardines in Canberra, Australia, July 11, 1956

Product	Packing Medium	Can Size	Price Per Can	
			s.d.	U. S. Cents
Norwegian sills	Sardine oil	3¾ oz. flat	1s.10d.	21
Norwegian sills	Sardine oil	½ size flat	1s. 3d.	14
French sardines	Olive oil	4½ oz. flat	3s. 6d.	39
Portuguese sardines . .	Olive oil	4½ oz. flat	3s.	34
Portuguese sardines . .	Olive oil	7 oz. flat	6s. 9d.	76

The domestic consumption of sardines is almost entirely from imports. The past two years consumption has been about 5 million pounds annually; however, import restrictions have limited quantities entering Australia.

Per-capita consumption of canned fish varies annually depending on the quotas granted importers. Fish is not a staple item in the diet of Australians. Prior to the immigration program of Europeans, sardines were consumed in fairly limited amounts in Australia. The increase in demand for sardines is a direct result of the tastes of the "New Australians." The trend is for an increase in the demand for sardines; however, the amounts authorized to be imported depend on the balance-of-payments position of Australia.

Table 2 - Average Retail Prices of Imported Canned Sardines (Double Layer, 3¾ oz., Olive Oil) in Sydney, 1951-55

Currency Unit	Jan.-Mar. 1956	1955	1954	1953	1952	1951
	(Per Can)					
In pence (d.)	21.31	21.28	21.60	21.48	21.10	19.50
In U. S. cents	19.88	19.85	20.15	20.04	19.69	18.19

The popular sizes of canned sardines are almost exclusively the small 3¼-5 oz. flats. A limited amount of other sizes has been offered for sale, but they sell only when the preferred flats are not available.

The most popular packing medium is olive oil; other mediums, mostly vegetable oils, are offered to the consumers but are not as readily acceptable.

Sardine consumption is the greatest among the "New Australians." The majority of these people coming from Continental Europe would be classed in the low-income group because of their unskilled work. Actually, this may not be a correct classification because these people are industrious and by working overtime and by multiple employment their income by Australian standards would place them in the middle-income group. Sardine consumption other than by the "New Australians" would be by all income groups and influenced by religious beliefs.

Table 3 - Average Wholesale Prices of Imported Canned Sardines (Double Layer, 3¾ oz., Olive Oil) in Melbourne, 1953-56

Currency Unit	April-June 1956	Jan.-Mar. 1956	1955	1954	1953
	(Per Dozen Cans)				
In shillings (s.) and pence (d.)	16s. 8½d.	15s. 8½d.	15s. 2½d.	14s. 7¾d.	15s. 7¾d.
In US$	1.87	1.76	1.70	1.64	1.75

Australia's canned sardine imports have climbed steadily from 420,000 pounds (valued at AŁ88,000 or US$197,000) in 1952/53 to 4.7 million pounds (valued at AŁ835,000 or US$1,870,000) in 1953/54, and to a record high of 5.7 million pounds (valued at AŁ1,062,000 or US$2,378,000) in 1954/55 (table 4). The majority of sardine imports are from Norway--84 percent in 1953/54 and 71 percent in 1954/55. It is estimated that imports for 1955/56 were at a slightly reduced level because of import restrictions. The import level for 1956/57 has been reduced a further 25 percent by import restrictions, effective July 1, 1956. Effective July 1, 1956, the import quota is 75 percent of 1954/55 imports and the budget is entirely for the non-dollar areas. Canned sardine imports fall into Category A for import license purposes.

Table 4 - Australia's Canned Sardine Imports 1953/54-1954/55

Country of Origin	Quantity		Value			
	1954/55	1953/54	1954/55		1953/54	
	1,000 Lbs.	1,000 Lbs.	AŁ1,000	US$1,000	AŁ1,000	US$1,000
United Kingdom . .	359	357	81	181	67	150
Other British Countries	99	-	13	29	-	-
New Zealand . . .	-	14	-	-	6	14
Morocco	97	32	15	33	6	13
Denmark	236	-	31	70	-	-
Norway	4,084	3,927	795	1,780	713	1,598
Sweden	37	-	6	15	-	-
Germany	274	-	38	84	-	-
Portugal	471	161	74	166	23	51
South Africa . . .	-	90	-	-	6	13
Other	60	89	9	20	14	31
Total . . .	5,717	4,670	1,062	2,378	835	1,870

The import duty on canned sardines is 1d.(0.933 U.S. cents) a pound for British preference countries, 2d.(1.87 U.S. cents) a pound for most-favored countries, and 3d.(2.8 U.S. cents) a pound for other countries, principally Japan.

Because of Australia's present balance of payments difficulties and limited dollar earnings, it is extremely doubtful if they would favor or permit sardine imports from the dollar area. Australia prefers to utilize dollars for the purchase of raw materials, plant, and machine goods from the dollar countries.

The Australian Government is not involved in the purchase of sardines, but it does control imports by a quota and import license system.

The importer who obtains a license imports the sardines. The importer sells to a wholesaler, who, in turn, sells to the retail trade. In some cases the importer would also be the wholesaler.

Note: Values converted at the rate of AŁ1 equals US$2.24.

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CULTURED PEARL FARM: The first step toward the establishment of a joint Japanese, Australian, and United States cultured pearl farm occurred on June 20 when a Japanese pearling lugger arrived at Broome, Western Australia. The lugger carried 15 Japanese specialists who are to begin the culture of pearls in a four-square-mile area in Brecknock Harbor, between Augustus Island and the mainland some 200 miles north of Broome.

The Nippon Pearl Company of Tokyo made an agreement with an Australian company, Pearls, Pty. Ltd., whereby the former is to supply specialists and about half the funds required and the latter is to be responsible for all arrangements in Australia.

The arrangements were approved by the Commonwealth and the State Governments, and the Australian company (in which Male and Co., Broome pearlers, Brown and Dureau Ltd., Melbourne importers and exporters, and the Otto Gerdau Co., New York, are participants) received a three-year license for the pearl farm area. It was reported that some 35,000 immature oysters would be planted in the first year and that the bulk of the artificial pearls produced would be marketed in the United States, a July 27 dispatch from the United States Consulate at Perth announces.

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NEW DEPARTMENT OF AGRICULTURE, FISHERIES, AND WHALING ESTABLISHED: In the reorganization of Australia's Federal Ministry in January 1956, the Department of Commerce and Agriculture was abolished and its commerce functions became the responsibility of a new Department of Trade; and agriculture, fisheries, and whaling were given the full-time attention of a new Department of Primary Industry.

Some of the views on fisheries of the new Minister of Primary Industry as published in the (Australian) Fisheries Newsletter of March 1956 follow:

". . .Our agricultural and pastoral production are much greater in volume and value than our fishery production. This does not mean that fisheries, the second branch of food production, are to be regarded as of little importance.

"In fact, fishing is already an important industry, with production of about 57,000 tons and earning over five million dollars a year for Australia, plus 22,350 tons of whale products with an export value of about £1.6 millions.

"Other factors must also be taken into consideration.

"Even in a meat eating country like Australia, fish is needed for variety and for its special nutritional values, particularly in institutional and invalid diets. And of course there is the national need to increase exports to which our fisheries resources, if properly developed, could make an even greater contribution; for example, prawns, which I will be mentioning again.

"In face of this double need for increased fish production, the catch is unfortunately not keeping pace with our rapidly growing population. Normally, imports provide about half the supply of fish available for consumption in Australia. The last few years should have taught us how unwise it is to rely on imports for essential needs. The recent restriction of imports of course includes fish.

"Moreover, if we can produce more fish and thereby import less, or at least not an increasing quantity to meet the growing shortage, we shall correspondingly improve Australia's trade position.

"There is, therefore, urgent need to explore our latent fishery resources and to begin, as soon as possible, to develop them.

"I know, for example, there are trawling grounds in the Great Australian Bight which are not being worked but which could produce a big catch of fish suitable for consuming in fresh form.

"I think further work may be needed on tuna, for the slow development of this promising young fishery is not wholly due to competition in overseas markets.

"There is also work to be done for the prawn fishery, which one experienced American fishing executive thinks may become even a bigger dollar earner than crayfish.

"I have read with interest part of the discussion which proceeded in the Newsletter through most of last year on developmental problems and how they might be solved. It seems clear that some lead is required to awaken a new spirit of enterprise and enthusiasm in the fishing industry, and to make a start with the harvesting of our latent sea food resources. South Africa in its Fisheries Development Corporation found one way of doing this.

"Nobody of course would expect me already to have to come to any conclusion as to what might be the best way of going about fishery development in Australia. But I am glad to take this early opportunity of telling professional fishermen and the other sections of the fishing industry in Australia (for in any developmental plans fishermen, processors and distributors will all have to pull together) that it is my desire as Minister for Primary Industry to see fish production greatly increase, both for domestic consumption and also to provide exports to help pay for the imports which Australia must obtain for its national development. ..."

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SHRIMP EXPORTS TO UNITED STATES: Arrangements have been completed to export the bulk of raw headless shrimp produced by the Queensland Professional Fishermen's League to the United States. It is hoped that this may be the beginning of a substantial dollar export trade in shrimp to the United States, reports the

State Secretary of the League. The frozen shrimp (Banana prawn, Penaeus merguiensis) will be exported by the Fish Board, states the Australian Fisheries Newsletter of June 1956.

The price offered by the Board has been accepted by the members of the League and the Board is extending facilities to the fullest to complete shipments to the United States and "I have every reason to believe it could become a million dollar industry," says the State Secretary.

The shrimp will be exported raw headless in four grades, ranging from 15-25 count for the largest to 40 for the smallest. Fishermen will receive 1s.9d. (19.5 U.S. cents) a pound heads on, or 2s. 9d. (30.7 U.S. cents) heads off, net at place of production. Loss of weight in heading is about 22 percent.

United States importers have indicated they will take a very large quantity if shipments are satisfactory.

Note: Values converted on basis of A£1 = US$2,232.

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WESTERN AUSTRALIA SHRIMP SURVEY: In 1952 the Western Australian State Government Fisheries Department made a vessel, the P. V. Lancelin, available for a shrimp or prawn survey from Fremantle to Broome. The survey was made during winter, the least favorable part of the year for such an investigation. Nevertheless, results were promising, the June 1956 (Australian) Fisheries Newsletter states.

The following winter (1953), the Exmouth Gulf area was investigated. This region provided a certain amount of shelter, plus suitable trawling grounds necessary for the development and testing of fishing gear. This work was resumed and extended during the winter of 1954.

Quantities of the following commercial species were obtained during the 1952 survey: tiger prawn (Penaeus esculentus), banana prawn (P. merguiensis), Western Australian king prawn (P. latisulcatus), greentail prawn (Metapenaeus mastersii). Other species were caught but none are at present of commercial importance.

For completeness a summer survey was essential and the P. V. Lancelin was made available for September to May, 1955/56. A refrigerated fishing vessel, the Jon Jim, accompanied the P. V. Lancelin for the first few weeks of the cruise, to examine the possibilities of catching and freezing shrimp commercially. Results during the early part of the cruise were encouraging. In winter the tiger prawn had predominated, but now large quantities of the banana prawn were caught, the best single catch from one hour's trawl being 400 pounds.

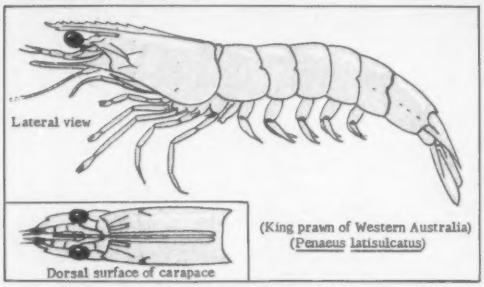
Peel Inlet: This estuarine system resembles many on the east coast of Australia. The high salinity of Peel Inlet in late summer may be responsible for the paucity of prawns there, and may confine them to the Murray River where most are caught at this time of the year.

The principal species caught is Metapenaeus mastersii (Haswell), known in eastern Australia as the greentail or greasyback, but referred to as the school prawn in Western Australia. The school prawn of eastern Australia is Metapenaeus macleavi (Haswell), and it would be better if the common names were uniform, provided school prawn is not too firmly established locally. The Peel Inlet shrimp do not have such a distinctive green tail as those from eastern Australia, but have nevertheless, a distinctly greenish tinge. (Species from Exmouth Gulf have a reddish tail, but this is a peculiarity of specimens from this region.)

There is some evidence that the western and eastern Australian M. mastersii are distinct subspecies. There are several constant anatomical differences and in addition they reach sexual maturity at different average sizes.

All the shrimp were caught in shallow water at night during January and early February and were sexually mature, and a large proportion of the females were ripe and impregnated. This indicated that spawning occurred at this region of the Murray River. The spawning of this prawn so far up an estuarine system is most unusual, especially in a region with a low salinity surface layer, into which shrimp move at night. The lower layers of

higher salinity would provide an environment more usual for spawning shrimp of this species. At Pinjarra there was a shallow sill with very low salinity water above it, and this may provide an effective barrier to the larger shrimp. However, postlarval shrimp about half an inch long have been known to penetrate up a river into nearly fresh water, and it is quite likely that the upper regions of the Murray River have a large juvenile population. Suitable equipment for collecting these small shrimp, and also for trawling the bottom of the river, was not available at the time, and further information as to the population distribution could not be obtained.



(King prawn of Western Australia)
(Penaeus latisulcatus)

It is of interest that the fishery is confined to the hours of darkness. In the Brisbane River, Queensland, this species is most often caught with small trawls during daylight. Some trawling at dusk and night is also done, usually in the upper reaches of the river. It would be of interest to use a beam trawl (no more than eight feet across) in the Murray River during daylight.

It is thought most unlikely that the present methods of fishing could appreciably deplete the shrimp population of the Murray River. Trawling by several dozen small craft has been carried out in the Brisbane River, Queensland, for years without any reduction of abundance. As the shrimp are sexually mature at capture, and as it is presumed they do not survive a season's spawning, it is obvious there has been no reduction in average size due to overfishing.

Large annual fluctuations are common in most shrimp fisheries. The peculiar hydrographical nature of Peel Inlet and its rivers is likely to cause even greater population fluctuations here than elsewhere. The larger shrimp have moved far up the system by the time winter flooding occurs and are likely to be subject to a greater mortality. During winter in these latitudes growth and activity are almost suspended. In the Brisbane River a large number of near-mature shrimp survive winter, as well as small juveniles, so that there is a spring spawning which provides a late summer abundance. The smaller sizes reach maturity during summer and a constant population of large shrimp is maintained. At Peel Inlet, however, it is alleged that full-size shrimp are not obtained until well into summer. If this is correct, it is likely that a population of only small juvenile shrimp survives winter and provides the late summer catches. A prolonged winter with flooding could have a marked effect on such a population.

Exmouth Gulf: The species caught here are the tiger prawn, Penaeus esculentus (Haswell), the banana prawn, P. merguiensis (de Man), and to a much lesser extent the king prawn, P. latisulcatus (Kishinouye) and the brown or endeavour prawn, Metapenaeus endeavouri (Schmitt). A few specimens of M. mastersii also appear sporadically. Two Trachypenaeus species and a Metapenaeopsis species are also common at night, but are too small to be of commercial interest. The tiger and banana prawns are sexually mature and hence, for the reason stated above, it is pointless to search for larger size shrimp. Male tiger prawn are sexually mature at an average length of 145 mm. (5.7 inches, and females at an average of 155 mm. (6.1 inches). Banana prawn are sexually mature at a slightly larger size than the tiger prawn (about $\frac{1}{4}$ in. longer for both sexes).

Numerous trawls with the small frame trawl were made in shallow water and in Beadon Creek, Onslow, and Wapet Creek, Exmouth Gulf. Salinity of water samples from these regions was very high, and probably explains the paucity of postlarval stages, as the marine fauna was a restricted one. While it is possible that the juvenile stages are to be found uniformly scattered over the large areas of shallow water found in the Gulf, previous experience suggests that this is unlikely. The younger stages seem generally to prefer sheltered water with plenty of algal cover. As the salinity of all the numerous inlets of the Gulf is likely to be high, it is quite probable that the bulk of the juvenile stages may be found outside. In eastern Australia several of the commercial species seem to work down a salinity gradient as growth proceeds.

The Ashburton River, whose mouth is adjacent to Exmouth Gulf, is reputed to have an unusually large stream discharge compared with other northwestern rivers. It is common local knowledge that small and medium size shrimp can be caught in this river fairly readily. Unfortunately it was not possible to examine this river and adjacent waters, but it is possible that a large population of juvenile shrimp is present in this river. As these approach sexual maturity, they would make their way down into the Gulf where spawning occurs. The high salinities would effectively bar the succeeding postlarval stages from moving to the southern part of the Gulf, and they would eventually move up the salinity gradient into the Ashburton River.

Unlike Peel Inlet, Exmouth Gulf should provide an extremely stable fishery. The average annual rainfall of the region is between 10 and 15 inches, and prolonged flooding of any of the "nursery-grounds" is most unlikely. However, as it is a spawning or prespawning population that would be fished, sudden short-term fluctuations are to be expected. These fluctuations seem a characteristic of shrimp fisheries, e.g. shrimp which have been abundant in an area for a few weeks suddenly disappear and are found in another nearby locality differing slightly from the previous one, and so on. These difficulties can be resolved only by local knowledge which must be found empirically. This would best be achieved by fishing vessels (preferably three or more) attempting to fish the area.

Present indications are that the tiger prawn will be the most regularly caught species, with the banana prawn comprising larger actual catches but extending over a shorter season. Both these shrimp, especially the latter, are excellent commercial species from all viewpoints.

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"WHITE" SPINY LOBSTER SEEN AS MOULTED ADOLESCENT: During the late spring, for approximately three weeks, there exists on the Western Australian coast an intensive fishery for a particular type of spiny lobster or crayfish, commonly called "white" crayfish. These are pale in color, readily distinguished in color only at the beginning of the "run" from the red spiny lobster (Panulirus longipes) caught in the deeper waters later in the season.

The "whites" are usually caught on a sand bottom and a pot set accidentally on reef bottom yields only red spiny lobster.

During the period in which "white" spiny lobsters are caught, the red spiny lobsters are in berry, i.e., they have spawned and have the bright orange eggs adhering to the pleopods of the abdomen. From visual observation, the ovaries of "whites" are not mature and mating has not taken place, i.e., the females have not acquired sperm packets.

During the "white" spiny lobster season (approximately November 20 to the end of December), the catch of "whites" along the coast is of the order of 2,000,000 pounds live weight. This quantity represents approximately one-fifth of the total production of all spiny lobster throughout the nine months' open season in Western Australia. The catch of "whites," therefore, in the eyes of the fishermen, is most important from the financial aspect.

From data collected over a period of years, white spiny lobsters can be said to be newly moulted animals, lacking the red pigment found in all size groups of the "red" spiny lobster.

The absence of small "whites" below $2\frac{1}{2}$ inches and above $3\frac{1}{2}$ inches suggests that the "whites" are a phase in the "red" cycle, and first occur when the spiny lobsters are approaching maturity. This could therefore be termed an adolescent phase. From tagging returns, the "whites" move offshore at a fairly steady rate after the commencement of the "run." The "run" of "whites" commences when the "whites" crawl into the pots. This does not necessarily indicate their immediate "arrival" from another area. They possibly migrate onshore sometime before they are caught. In any case they do not feed, since baited pots set before the "run" of "whites" yield nothing.

The non-attractiveness of the bait at this time can be explained by the fact that just prior to, and for approximately ten days after, moulting, food is not sought. When the "whites" do "run," however, they are caught in large numbers, the catches per pot increasing from a mere 1 or 2 to 30 or 40 overnight. The actual date of the commencement of the catch of "whites" varies from area to area and from year to year. There is nevertheless only about a fortnight's variation in its onset each year.

A possible picture of events could include the migration of adolescent pale-colored spiny lobsters to relatively shallow sandy areas where moulting takes place. This is followed by heightened feeding activity and a movement offshore with a possible tendency for the spiny lobsters to deepen in color. The numbers of the "whites" caught decrease until, in the words of the fishermen, "they disappear and the 'white' season has ended."

The fact that individual "whites" can be caught again the following "white" season suggests that this "white" phase is not restricted to only one period in the life of a spiny lobster, but that two "white" phases can occur at approximately the same time of the year in at least two successive years.

It has also been shown that an undersize "white" crayfish can grow to 3.0 inches in carapace length and take on the red coloration normally found in spiny lobsters at other times of the year, points out the (Australian) Fisheries Newsletter of June 1956.

Austria

CANNED SARDINE MARKET: Austria has no domestic production of sardines and sardinelike fish, such as true sardines, small herring, pilchards, and sprats (brisling), points out a June 29 dispatch from the United States Embassy at Vienna.

Of the canned sardines imported in Austria, the true sardines packed in olive oil are most popular among consumers. While smaller quantities of sprats (brisling) were imported in the past, particularly from Belgium, none are being imported now since they are not popular with Austrian consumers. Best estimate on Austria's consumption of canned sardines in 1955 was approximately 3,400 metric tons.

Sardines are quite popular with Austrian consumers, although meat is preferred to fish in general. For some years the trade has been trying to educate the general public to the excellence and good food value of fish in general, but no visible progress has been made. Sardines are not used for main courses as in some countries, but principally for snacks and sandwiches. Hors d'oeuvres served in restaurants, which also include sardines, command relatively high prices.

About 90 percent of the consumers prefer the $3\frac{1}{4}$-5 oz. flat cans. A few 1-lb. and 1-kilogram (2.2 lbs.) cans are purchased by restaurants, snack bars, and delicatessen stores. About 50 percent of the sardines consumed are packed in olive oil, and the others are packed in vegetable oil (20 percent), fish oil (15 percent) and tomato sauce (15 percent). The percentage of sardines consumed by the high, middle, and low income groups is estimated at 10, 40, and 50 percent, respectively. Retail market prices for the $3\frac{1}{4}$-5 oz. cans: olive oil pack from 17-20 U. S. cents a can, vegetable oil pack 11.5-19 cents, tomato sauce pack 12 cents, and fish oil pack 16 cents; 1-lb. rectangular olive oil pack 58 cents; 2-oz. olive oil pack 13 cents.

Obstacles to the import of canned sardines and sardinelike fish from the United States, according to trade sources, are:

1. Portuguese sardines, packed in olive oil, are most popular with Austrian consumers. As far as other packing mediums, such as vegetable oils and tomato sauce, are concerned, European flavors are preferred.

2. Prices of American canned sardines and sardinelike fish are comparatively high.

3. While sea freight charges on imports from the United States raise prices considerably, European continental exporters have relatively lower freight charges on exports to Austria.

4. Since sardines are rather expensive and not used for main courses, Austrian consumers prefer small cans.

Although imports from the dollar area of canned fish are liberalized, imports are handicapped by the reasons given above.

It is noteworthy that Portugal, although not a member of GATT, has a special agreement with Austria where Portuguese canned sardines are subject to an Austrian 15-percent ad valorem duty. This preferential rate does not apply, however, to other fish products imported from Portugal, such as anchovies, tuna, and mackerel.

Canned sardines are imported by commercial agents or importers. They in turn distribute the commodity to wholesalers, retail chains and retailers. The Austrian Government does not purchase sardines.

Austrian foreign trade statistics do not show canned sardines and sardinelike fish separately; they are included under canned fish and canned crustaceans.

In 1955 Austria imported a total of 5,499 metric tons of canned fish and canned crustaceans, valued at US$2,597,000. According to the best trade estimates about 60 percent of this amount was sardines and sardinelike fish, about 5 to 10 percent crustaceans, and the balance other canned fish (table 1).

Table 1 - Austria's Imports of Canned Fish and Crustaceans, 1955

Country of Origin	Quantity	Value		Estimated Percentage Composition of Imports
	Metric Tons	Million (S)	US$1,000	%
West Germany . .	2,160	22.9	879	40% small herring; balance other fish products (mainly herring fillets).
Yugoslav	822	11.8	453	50% true sardines; balance tuna and anchovies.
Denmark	598	6.7	258	80% small herring; balance mackerel, cod livers, and crustaceans.
Portugal	1,650	22.1	851	95% true sardines; balance tuna and mackerel.
French Morocco .	98	1.3	51	100% true sardines.
Other Countries1/	171	2.7	105	-
Total . . .	5,499	67.5	2,597	-

1/ Small quantities of canned sardines and sardinelike fish are also being imported from France, Norway, and Sweden.

Portugal furnishes Austrian importers with cans of the so-called "Club $\frac{1}{4}$" format, which are 25 and 30 millimeters high. One seldom sees in Austria the type can which Portugal ships to the United States, e.g. "usual $\frac{1}{4}$" cans, 22 millimeters high.

Trade sources attribute the low level of Moroccan sardine imports to political conditions in that area but expect that imports from that country will gradually increase. Sardines from French Morocco are good quality and cheaper than Portuguese brands, although the latter are better in quality.

Sardines imported from Portugal, French Morocco, and Yugoslavia are packed either in olive oil, vegetable oil (peanut oil), or other substances. Canned sardines and sardinelike fish imported from Denmark and Germany are principally packed in tomato sauce and soy bean oil.

Trade sources are of the opinion that fish packed in cottonseed oil would not find a market in this country as the taste of this oil would not appeal to Austrian consumers.

Note: Values converted to US$ equivalent at the rate of 1 schilling equals US$0.03846.

Belgian Congo

CANNED SARDINE MARKET: There is no domestic production of canned sardines in the Belgian Congo. Of the 1,862 metric tons (valued at US$760,675) of canned sardines imported in 1955, 125 tons were imported from the United States. Ninety percent of the consumers, practically all Europeans in the high income group, prefer the 3¼-5 oz. can of sardines packed in olive oil. About 9 percent buy the 8-oz. tall cans, and the balance 8-oz. ovals and 1-lb. ovals. The olive-oil pack is almost universally preferred. The retail market price for the 3¼-5 oz. can of canned sardines in olive oil ranges from 16-21 U.S. cents a can, points out an August 6 dispatch from the United States Embassy at Leopoldville. The 8-oz. tall packed in olive oil retails for 32 cents a can. Canned sardines in tomato sauce retail in 8-oz. ovals at 34 cents a can and in 1-lb. ovals at 39 cents a can.

The Portuguese sardine industry is well established in the Belgian Congo and its products are known and liked by Europeans. The Africans are not sardine consumers, since they are able to obtain local dried fish much more cheaply. Only if United States sardines were much cheaper than the present prices, including cost of transport, would there be an opportunity for exports. Sardines are too expensive for the bulk of the African population and must compete in European tastes with European tuna, as well as the large quantities of fresh and frozen fish brought in from the neighboring colony of Angola.

A large proportion of the food importers are Portuguese, both as retailers and as intermediaries in the native and rural trade, and it is only natural that their business contracts would be with suppliers of Portuguese sardines, although French sardines are seen in the "luxury" food stores.

Burma

CANNED SARDINE MARKET: There is no production of canned sardines in Burma, an August 2 dispatch from the United States Embassy at Rangoon points out.

Of the canned sardines sold in Burma, 55 percent are packed in 1-lb. oval cans, 25 percent in 8-oz. ovals, 10 percent in 8-oz. rectangulars, 5 percent in 8-oz. talls and 5 percent in 1-lb. talls.

About 80 percent of the sardines consumed are packed in tomato sauce, 5 percent in olive oil, 5 percent in vegetable oil, 5 percent in brine, and 5 percent natural.

Burma's Retail Prices for Canned Sardines

Size of Can	Type of Pack	Price Per Can	
		Kyat	U. S. Cents
3¼ to 5 oz.	Tomato sauce	0.90	19
3¼ to 5 oz.	Brine	1.25	26
8 oz. tall	Olive oil	2.25	47
8 oz. tall	Vegetable oil	2.50	53
8 oz. tall	Brine	1.50	32
8 oz. oval	Tomato sauce	1.50	32
8 oz. oval	Brine	1.50	32
8 oz. rectangular	Olive oil	2.25	47
1-lb. oval	Tomato sauce	1.90	40
1-lb. oval	Brine	2.25	47
1-lb. tall	Brine	2.25	47
15 oz. (Japanese, price controlled)	Tomato sauce	1.90	40
7½ oz. (Japanese, price controlled)	Tomato sauce	1.50	32

Note: Values converted at the rate of one kyat equals 21 U. S. cents.

The percentage of sardines consumed by the high, middle, and low income groups is estimated at 10, 70, and 20 percent, respectively.

The retail market price for the 1-lb. oval canned sardine packed in tomato sauce is about 40 cents a can, and the 8-oz. oval 32 cents (see table).

The Burmese Government conserves its United States dollars and other American-account funds by restricting imports to essential commodities not economically obtainable from soft-currency areas. Canned sardines are, therefore, purchased principally from sources in Japan, Portugal, the United Kingdom, and Denmark. The Bulletin of Import Trade lists canned fish importations without specifying types.

Domestic distribution is ordinarily effected through Burmese import firms. Importers then wholesale the imports to retail outlets without promotion by either.

Imports of Japanese origin are purchased by the Civil Supplies Management Board for distribution to registered cooperatives for sale at fixed prices.

In all probability, transportation difficulties (including cost) and less westernized tastes reduce consumption greatly outside the city. In Rangoon, probably only occidentals and westernized orientals eat many sardines, to judge from the class of retail outlets which handle them.

The population of Burma is comprised of many different ethnic and religious groups, almost all of whom satisfy a large portion of their protein requirements with fish, which is an acceptable food. The local fish industry cannot supply enough fresh fish, and there are no processing facilities. Consistently, one of the largest imports from Japan has been fish and fish preparations, and this category forms a respectable proportion of the total imports.

Canada

AUREOMYCIN USE ON FISH ACCEPTED BY AUTHORITIES: The use of aureomycin within specific quantitative limits has been found acceptable by the Canadian Department of National Health and Welfare. The necessary amendments to the regulations to permit this use will be recommended to the Minister by the Food and Drug Directorate, reports the August 10 issue of the Fisheries Council of Canada Bulletin.

Canada is reported to be the first country in the world to approve the use of aureomycin on edible fish.

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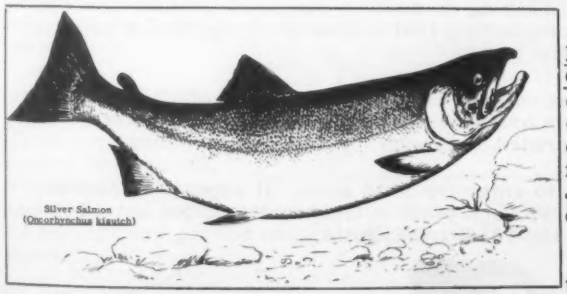
Silver Salmon
(Oncorhynchus kisutch)

FRESH SILVER SALMON EXPORTS PROHIBITED AFTER AUGUST 31: Exports of fresh silver or coho salmon are prohibited after August 31 each year as a result of changes in British Columbia fishery regulations, reports the July 1956 Trade News of the Canadian Department of Fisheries.

In past years special prohibition orders were issued from year to year. The regulation is now amended so that the order will have a continuing application.

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PEARL ESSENCE PRODUCED ON WEST COAST: Pearl essence, for many years produced on the North American Atlantic coast, is now being produced on the Pacific from British Columbia herring scales. As fish are pumped from seiner to packing boat, they pass over baffles and screens which remove the scales without damaging the fish, about 100 hundred tons of fish produce one ton of scale, which produces one pound of essence, according to reports from Canada.

Denmark

FISH CONSUMPTION DOWN: Speaking to the annual convention of retail fish dealers, the Danish Minister of Fisheries stated that in the past 5 to 6 years the per capita consumption of fish in Denmark has declined steadily from 35.2 to 24.2 pounds annually. The main reason, he asserted, is the high price of fresh fish and, in this connection, he referred to the steady increase in the number of boats fishing for industrial fish and the resulting decline in the catch of fish for human consumption.

The trend toward more industrial fishing continues and there seems little possibility of formulating a plan to check it. Another factor in the high price of fish is the high cost of distribution, which is also connected with the Danish consumer's preference for buying fish in a live rather than frozen state, points out a United States Embassy dispatch (August 10, 1956) from Copenhagen.

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LIFT-UP WHEELHOUSE FOR SEINERS: A novel feature has been included by a Danish designer (Knud E. Hansen) of two 65-foot-Diesel seiners being built in England. The entire wheelhouse and skipper's cabin will be constructed of aluminium and built to lift off in one piece so that the complete engine installation can be removed. This will save time and expense during repairs and maintenance. All piping and electrical leads have been designed to break on the superstructure.

Ecuador

REGULATIONS AFFECTING FISHERIES: The Ecuadoran Monetary Board was authorized to require fishing companies to convert up to their entire export earnings at the Central Bank's official rate of exchange. The companies up until now have had to convert only $100 a ton at the official rate. The balance could be kept or converted on the free market. Fishing companies (three of the four now operating are American-owned) are complaining that a drastic change in the present formula would put them out of business.

Another new regulation fishing companies are protesting requires that export taxes be paid in full on fish exports unless they are clearly "industrialized," i.e., canned rather than merely refrigerated or frozen.

A fifth fishing company plans to enter the field soon. It expects to establish a cannery, freezing plant, and cold-storage plant in Guayaquil, points out a United States Embassy dispatch (August 13, 1956) from Quito.

Egypt

CANNED SARDINE MARKET: There is no production of canned sardines in Egypt, states a July 19 dispatch from the United States Embassy at Cairo. Consumption of sardines is comparatively small in relation to the population.

True sardines are imported largely from Portugal and to a lesser extent from Morocco. Small quantities are also imported from France and Yugoslavia. Imports of true sardines during 1955 amounted to 813,275 pounds (valued at US$196,311) as compared with 1.1 million pounds (valued at US$271,118) for 1954.

Table 1 - Egypt's Canned Fish Imports by Country of Origin, 1954-55

Country of Origin	True Sardines						Other Canned Fish1/					
	1955			1954			1955			1954		
	Quantity	Value		Quantity	Value		Quantity	Value		Quantity	Value	
	1,000 Lbs.	E£1,000	US$1,000	1,000 Lbs.	E£1,000	US$1,000	1,000 Lbs.	E£1,000	US$1,000	1,000 Lbs.	E£1,000	US$1,000
France	10	1.7	5	11	1.4	4	-	-	-	-	-	-
Japan	-	-	-	15	0.8	2	17,553	710.1	2,034	9,571	425.0	1,211
Morocco	88	7.0	20	143	9.8	28	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-	230	11.0	31	449	21.6	62
Portugal	667	56.5	161	916	78.6	224	264	20.4	58	201	19.4	55
Union of South Africa	-	-	-	-	-	-	769	24.9	71	12	0.8	2
United Kingdom	-	-	-	-	-	-	34	2.5	7	54	4.5	13
United States	-	-	-	-	-	-	62	2.2	6	121	5.1	14
Western Germany	-	-	-	-	-	-	118	4.8	14	147	7.1	20
Yugoslavia	22	1.7	5	39	3.2	9	-	-	-	-	-	-
Other Countries	26	3.0	5	12	1.3	4	349	18.2	52	104	7.7	23
Total	813	68.9	196	1,136	95.1	271	19,379	794.1	2,263	10,659	491.2	1,400

1/ Classified as follows: "Other canned fish including pilchard, mackerel, anchovy, and herring, but not including salmon and tuna."

All other types of canned sardines are classified in the Egyptian official import statistics under the general heading "Other canned fish including pilchard, mackerel, anchovy, and herring, but not including salmon and tuna." Imports under this classification in 1955 amounted to 19.4 million pounds (valued at US$2.3 million) as compared with 10.7 million pounds (valued at US$1.4 million) for 1954. Of these "other canned fish" imports, by far the largest percentage is made up of pilchard and mackerel. In 1955, mainly because of the price factor, Japan supplied 91 percent of the total quantity imported under "other canned fish."

Imports of all canned fish from the United States are insignificant due mainly to Egypt's policy of preserving dollar exchange for other imports such as capital goods.

The most popular size can of true sardines purchased by 95 percent of the consumers is the 4½-oz. flat. Of the other types of canned sardines, about 80 percent of the consumers prefer the 5-oz. and 15-oz. tall sizes, 50 percent of the consumers prefer the 5-oz tall, 15 percent the 8-oz. tall, 30 percent the 15-oz. tall, and the balance other sizes.

Table 2 - Egyptian Retail Prices for Canned Sardines

Type	Price Per Can	
	Piasters	U. S. Cents
True Sardines in Olive Oil:		
4½-oz. Portuguese	3.7-4.5	10.5-12.8
4½-oz. Moroccan & other origin	3.5-4	10.0-11.4
True Sardines in Vegetable Oil:		
4½-oz. Portuguese	3.5-4.3	10.0-12.3
4½-oz. Moroccan & other origin	3.3-3.8	9.4-10.8
Other Types of Sardine (Pilchard or Mackerel), Natural Pack:		
15-oz.	5.7-6.2	16.2-17.7
8-oz.	3.8-4.2	10.8-12.0
5-oz.	2.6-2.8	7.4- 8.0

About 75 percent of the true sardines consumed are packed in olive oil, 20 percent in vegetable oil, and 5 percent in tomato sauce. Of the other types of sardines consumed, 90 percent are packed natural, 8 percent in tomato sauce, and 2 percent in other condiments.

The percentage of true sardines consumed by the high and medium income groups is estimated at 60 and 40 percent, respectively. The percentage of other

types of canned sardines consumed by the medium and low income groups is estimated at 25 and 75 percent, respectively.

Prices of canned sardines are regulated by an Egyptian Government decree which provides that the prices paid by the consumer should not be above 16 percent of the landed cost of the goods, this 16 percent profit being divided by the importer, the wholesaler, and the retailer. The retail price for the 4½-oz. size of true sardines from Portugal ranges from 11-13 U.S. cents (see table 2).

An import license should first be obtained to make possible the importation of canned sardines or any other commodity. The import customs duty on canned sardines is 8 percent ad valorem plus a quay duty of 0.8 percent ad valorem.

The largest percentage of the business is done through importers who are at the same time distributors selling to wholesalers and sometimes to large retailers. These importers account for about 85 percent of the imports. The remaining 15 percent of the business is done through sales agents who book orders for direct shipment from the exporter to large local wholesalers.

Formosa

CANNED SARDINE MARKET: Since there is no domestic pack of canned sardines in Formosa, local consumption is satisfied entirely by imports, states a July 19 dispatch from the United States Embassy at Taipei.

Consumption of canned sardines has been decreasing considerably during the last few years due largely to reduced imports resulting from the Government import policy of discouraging importation of consumption goods and expanding the local fishing industry. The relatively high price, which includes a 60-percent import duty, also discourages consumption of this commodity which used to be consumed by the populace during the Japanese occupation of Taiwan. A further decline in consumption is anticipated in the future.

Formosa's Imports of Canned Sardines, 1954-55

Country of Origin	1955			1954		
	Quantity	Value		Quantity	Value	
	Lbs.	NT$	US$	Lbs.	NT$	US$
Japan	1,164,534	3,911,687	157,856	4,341,120	16,182,470	653,044
Canada	-	-	-	1,457	4,972	201
West Germany	-	-	-	992	11,472	463
Korea	-	-	-	5	39	2
United States	216	1,279	52	73	456	18
Origin unknown	84	1,353	55	-	-	-
Total	1,164,834	3,914,319	157,963	4,343,647	16,199,409	653,728

Eighty percent of the consumers prefer the 15-oz. oval cans, and 20 percent the 7.5-oz. ovals. All of the canned sardines consumed in Formosa are packed in tomato sauce and are used only by the high-income group. This is because of the relatively high price on the local market, compared with the price of fresh fish. Retail market prices for the 7.5-oz. ovals are 30 U.S. cents a can and for the 15-oz. ovals, 46 cents a can.

Imports of canned sardines during 1955 amounted to 1.2 million pounds (valued at US$157,963) as compared with 4.3 million pounds (valued at US$653,730) during 1954. The majority of the imports during 1955 were from Japan with a small amount from the United States (see table).

Canned sardines are marketed through importers who sell to wholesalers, who in turn sell to retailers or grocers. In Taipei the larger wholesalers are in some cases also importers. Some wholesalers or importers of canned food also maintain retail outlets. Most of the importers are concentrated in Taipei.

Note: Values converted to US$ equivalents at the official rate of NT$24.78 equals US$1.

France

FISH CANNING INDUSTRY AND CANNED SARDINE MARKET: Pack: The French fish canning industry in 1955 comprised 163 companies with 222 plants in operation. A total of 17,017 persons worked a total of 14 million hours in these plants. Salaries and wages totaled 1.9 billion francs (US$5.4 million) for 1955.

Table 1 - France's Pack and End-of-Year Stocks of Canned Sardines and Sardinelike Fish, 1952-55

Product	Pack[1/]				End-of-Year Stocks[1/]			
	1955	1954	1953	1952	1955	1954	1953	1952
	(Metric Tons)				(Metric Tons)			
Sardines	10,340	20,900	16,960	9,660	2,422	8,932	5,200	5,100
Sprats & anchovies	530	706	120	1,900				
Mackerel	14,126	12,380	10,886	10,094	2,348	2,043	2,200	1,300
Herring & pilchard	6,080	4,430	8,000	6,440	4,225	3,210	4,400	3,400
Total	31,076	38,416	35,966	28,094	8,995	14,185	11,800	9,800

1/ Semigross weight--weight including immediate container.

Canned sardines (including sprats and anchovies) comprised 19.3 percent of all fish canned in France in 1955, and 39.4 percent of the total in 1954. The corresponding percentages for both sardines and sardinelike fish were 54.4 percent in 1955 and 70.1 percent in 1954.

The pack of canned sardines and sardinelike fish in France during 1955 amounted to 31,076 metric tons as compared with 38,416 tons in 1954, according to a United States Embassy dispatch from Paris dated July 23.

Consumption: Canned sardines and sardinelike fish are consumed regularly at all income levels in France except the very lowest. The trade has estimated that only 16 percent of French families are not at this time regular consumers. Of these,

Table 2 - France's Estimated Consumption[1/] of Canned Sardines and Sardinelike Fish, 1953-55

Type	Consumption			Percentage of Consumption Supplied by Domestic Pack		
	1955	1954	1953	1955	1954	1953
	(Metric Tons)			(%)		
All sardines and sardinelike fish[2/]	52,281	51,984	56,219	59	74	64
Only sardines, sprats, and anchovies[3/]	34,233	34,970	40,133	-	-	-

1/ Semigross weight--weight including immediate container.

2/ Since this item in the French Tariff (Tariff Item No. 05-15-13) includes all types of canned fish except salmon and true sardines, it is not possible to obtain exact foreign trade data for mackerel, herring, and pilchard. Imports and exports of these have been estimated as percentages (8 percent of imports and 55 percent of exports of Item No. 05-15-13 for the years shown) suggested by representatives of the trade. Since countries outside the Franc zone account for a relatively small proportion of imports and those from North Africa do not include mackerel, herring, or pilchard, the 8-percent estimate is approximately confirmed by analysis of statistics.

3/ Production, plus imports, minus exports (Tariff Item No. 04-15-12) adjusted for change in year-end stocks.

only 8 percent are considered outside the ranks of potential consumers, for reasons of extremely low income, prejudice against conserved foods in general, or domicile in areas where freshly-caught fish is available daily at low prices.

In a market already so deeply penetrated, opportunity for horizontal expansion is therefore limited to 8 percent and any important increase in sales will depend upon vertical expansion, that is greater consumption by families which are already including canned fish fairly regularly in their diet. The trade has estimated that of 100 regular customers of canned sardine-type fish, 81 buy sardines repeatedly, 22 buy mackerel fillets repeatedly, and 20 buy herring or pilchard repeatedly, with the overlap of 23 percent being families which regularly consume two or more of the these products. In general, the market has been established by the true sardines, and sales of the other sardine-types are developing progressively among families which have acquired an appreciation of canned fish through the use of sardines. The other types are therefore more susceptible of horizontal expansion.

Table 3 - Most Popular Can Sizes of Canned Sardines and Sardinelike Fish Marketed in France

French Can Nomenclature	Weight of Contents		Estimated Percentage Marketed
	Grams	Ounces	Percent
Sardines:			
1/15 P. 1/ . . .	46	1 3/4	17
1/10 P. Club 20	69	2 1/2	20
1/8 P.	87	3	5
1/6 P. 25 . . .	125	4	25
1/4 P. Club 30 .	130	4 1/4	9
1/4 P. 30 . . .	173	6	11
1/3 P. 40 . . .	232	8 1/4	9
1/2 P.	375	12 1/4	2
1/1 P.	750	24 1/2	1
Others	-	-	1
Mackerels: 2/			
1/6 P. 25 . .	122	4 1/4	16
1/4 Club 30 . .	127	4 1/2	36
1/4 P. 30 . . .	183	6 1/2	24
1/2 P. (longue)	367	13	8
1/3 P. (longue)	245	8 3/4	16
Pilchard-Herring:			
1/2 P. (ovale-pilchards) . .	367	13	3/

1/ Also anchovies.
2/ Based on a market survey by the trade in 1952. Representatives of the trade affirm that conditions have not materially changed since that time.
3/ Most popular size.

The spread of consumption is fairly even between income groups. The general average of somewhat over 80 percent of families has also been found to apply fairly evenly among rural, semirural, and urban groups, and through the several seasons. The stability of the market is probably due to the custom of serving a minor hors d'oeuvre course before the main dish of each meal.

There is no evidence of a steadily increasing trend through the past three years, but representatives of the trade are confident that a gradual increase in per capita consumption can be realized, depending of course upon the prices of sardine-types relative to alternative foods. Most of the competing products for hors d'oeuvres are more expensive than canned fish.

Retail Prices: Retail prices of canned sardines (see table 8) are becoming somewhat erratic because of strong upward pressures: (1) the 1955 catch was hardly half that of 1954, which was by no means a record year; (2) adverse weather conditions during the winter 1955/56 sharply increased prices of vegetable oil and especially olive oil (the latter is from 50-150 percent more expensive); (3) a certain amount of speculation in wholesale sardines. Differences in prices for the same can size are also to be reckoned: (1) various cooking methods, (2) incidental transportation differentials.

The 1956 mackerel catch has been far below expectations. This will in all likelihood send mackerel prices upwards in the same pattern as sardine prices.

Imports: In 1954, the last year for which a detailed breakdown is readily available, imports of canned true sardines from French Union sources were (in metric tons): Morocco 10,700; Algeria 4,061; Tunisia 1,278. There were no imports from the United States. The French Union sources enjoy a preferential position in the French market and the admission of sardines from Portugal is periodically negotiated as an integral part of the bilateral trade agreement (see table 9).

Table 4 - List of Standard Can Sizes Used in France for Canned Sardines and Sardinelike Fish

French Can Nomenclature	Weight of Contents		Dimensions	Type Fish Canned
	Grams	Ounces	mm.	
1/15	46	1¾	99 x 46 x 18.5	Anchovies & Sardines
1/10 P. (Club 20)	69	2½	104 x 59.8 x 20	Sardines
1/8 P.	87	3	95 x 60 x 24	"
1/6 P. 25 . . .	115	4	105 x 76 x 24	"
1/6 P. 25 . . .	122	4¼	105 x 76 x 24	Mackerel fillets
1/6 P. ovale . .	115	4	105.2 x 64.7 x 30.5	Sardines
1/6 P. Club 30 .	115	4	104 x 59.8 x 28.5	"
1/6 P. Club 30 .	122	4½	104 x 59.8 x 28.5	Mackerel fillets
1/4 P. 30 . . .	173	6	105 x 76 x 31.5	Sardines
1/4 P. 30 . . .	183	6½	105 x 76 x 31.5	Mackerel fillets
1/3 P. 40 . . .	232	8¼	154 x 55 x 40	Sardines
1/3 P. (Sardines)	232	8¼	115.7 x 94.6 x 32	"
1/3 P.	245	8¾	115.7 x 94.6 x 32	Mackerel fillets
1/2 P. (Sardines)	348	12¼	115.7 x 94.6 x 43.5	Sardines
1/2 P.	367	13	115.7 x 94.6 x 43.5	Mackerel (whole)
1/1 P. (Sardines)	697	1 lb. 8½	115.7 x 94.6 x 81	Sardines
1/1 P.	735	1 lb. 9¾	115.7 x 94.6 x 81	Mackerel (whole)
3/1 P. (Sardines)	2,094	4 lbs. 10	205.3 x 120.4 x 104	Sardines
3/1 P.	2,205	4 lbs. 13¾	205.3 x 120.4 x 104	Mackerel (whole)
Tall Rectangular:				
1/3 P. (longue).	245	8¾	154.1 x 55.4 x 40	Mackerel (whole)
1/2 P. (longue).	367	13	196.2 x 55.4 x 45	Mackerel (whole)
Ovals:				
1/6 P. (Ovale Poisson) . . .	115	4¼	105.2 x 64.7 x 30.5	Mackerel (whole)
1/2 P. (Pilchards)	367	13	160.5 x 108 x 37.5	Pilchards (or herring)
1/1 P. (Pilchards)	735	1 lb. 10	160.5 x 108 x 65	Pilchards (or herring)

Source: Institut National de la Conserve.

The exact volume of other sardine-type (mackerel, herring, pilchard, etc.--Item 04-15-13) imports is unknown because all canned fish other than salmon and true sardines are combined in one tariff item. The trade representatives consulted have estimated that only 8 percent of the import trade in this item consists of sardine-types and states that the principal sources of these are Norway, West Germany, the Netherlands, and the United Kingdom, all OEEC countries with which France conducts bilateral trade negotiations.

Table 5 - Packing Media for Canned Sardines and Sardinelike Fish Consumed in France, 1/ 1952-55

Packing Media	Percentage of Total Consumption			
	1955	1954	1953	1952
	. . . . . (%)			
Oil	39	50	46	45
Tomato sauce	11	8	11	10
Natural	29	24	22	25
Marinade (white wine sauce).	21	18	21	20
Total	100	100	100	100

1/ Based on a market survey made by the trade in 1952. Trade representatives affirm that conditions have not materially changed since that time.

Distribution: The production of sardine-type canned fish is generally sold by the canners direct to the retail outlets through salesmen operating throughout the country. Single orders from canners are generally in lots of full cases (one case containing 100 cans).

Table 6 - Trade Estimates of Packing Media for Canned Sardines and Sardinelike Fish by Type of Fish, 1955

Packing Media	Percentage of Total Consumption			
	Sardines	Mackerel	Herring	Pilchard
	(%)			
Vegetable oil (other than soya oil)	54	8	58	-
Olive oil 1/	42	-	-	-
Tomato sauce	4	-	-	-
White wine	-	92	42	-
Tomato and oil sauce	-	-	-	100
Total	100	100	100	100

1/ Olive oil percentage will presumably be lower for 1956 because of adverse weather conditions which brought about a sharp increase in price causing many canners to switch to vegetable oil (mostly peanut oil).

For small orders, that is, by dozens of cans of any of the categories of sardine-type canned fish, retailers are supplied by local wholesalers which number about 2,000 throughout France. Restaurants and other large users generally apply either to the canners or to local wholesalers, according to their requirements, rather than to retailers. Chain-store purchasing offices deal direct with the canners.

About 12 important food-product wholesalers in the Paris area are handling and controlling the whole of the import business in France. They are operating along lines somewhat similar to those used by the canners, sending salesmen throughout the country. Some of them keep stocks for redistribution in the main cities of France. Many have exclusive agencies for definite makes of canned food products.

Table 7 - French Consumption of Canned Sardines and Sardinelike Fish by Income Groups and by Type of Fish

Type of Fish	Income			Over-All Average
	High	Middle	Low	
	(Percentage Buying Each Type of Product in Each Group--%)			
Sardines	85	82	76	81
Mackerels	23	23	20	22
Herrings	9	10	10	10
Pilchards	5	11	14	10

Sardine-type canned fish is considered a standard item of the retail grocery business, and there are 213,000 retail grocers (212,866 in 1954) throughout France. This figure includes some 29,550 retail outlets of 102 chain-store groceries. In addition about 23,000 pork-butchers ("charcuteries") and about 6,000 fish dealers also sell sardine-type canned fish to supplement their specialties.

Government Purchase of Sardines: The French government purchases regularly sardine-type canned fish for the Armed Forces and Administration. The tonnage of canned fish purchased in 1954 (last typical year) was about 2,900 metric tons (i.e. about 7.5 percent of the 1954 sardine-type production). The armed forces which account for 80 percent of these purchases are expected to require increased amounts in the immediate future because of the North-African operations. Should the expected 1956 stock deficit affect the French Government's ability to meet its normal requirements, emergency import measures (outside normal trade) would then be resorted to; Portugal, Morocco, and Spain were mentioned by the trade as the most likely sources of supply if this should occur. As a rule, Government purchases are conducted through competitive bidding from canners who are requested each quarter-year by the several purchasing agencies to submit bids. These re-

quests for bids are publicized through official government organs, posters, and circulars to trade associations and chambers of commerce. A team of government experts controls the bidding and adjudication.

Table 8 - French Retail Prices[1/] for Canned Sardines and Sardinelike Fish

Can Size	Packing Media and Price Per Can						Contents Weight
	Vegetable Oil		Olive Oil		Tomato		
	Francs	U.S.¢	Francs	U.S.¢	Francs	U.S.¢	Ounces
Sardines:							
1/15 P.	38- 45	10.9-12.9	68- 78	19.4-22.3	n.a.	n.a.	$1\frac{3}{4}$
1/10 P. Club 20	55- 80	15.7-22.9	88- 98	25.1-28.0	n.a.	n.a.	$2\frac{1}{2}$
1/8 P.	92	26.3	138	39.4	n.a.	n.a.	$3\frac{1}{4}$
1/6 P. 25 . . .	85-100	24.3-28.6	120-195	34.3-55.7	73	20.9	4
1/6 P. Club 30	80-115	22.9-32.9	140-165	40.0-47.1	120-160	34.3-45.7	$4\frac{1}{4}$
1/4 Club 30 . .	80-110	22.9-31.4	90-185	25.7-52.9	n.a.	n.a.	$4\frac{1}{4}$
1/3 P. 40 . . .	158-220	45.1-62.9	200-225	57.1-64.3	n.a.	n.a.	$8\frac{1}{4}$
1/2 P.	-	-	390	111.4	n.a.	n.a.	$12\frac{1}{2}$

	White Wine		Contents Weight
	Francs	U.S.¢	Ounces
Mackerels:			
1/6 P. 25 . . .	60- 80	17.1-22.9	4
1/6 P. Club 30	60- 85	17.1-24.3	$4\frac{1}{2}$
1/4 Club 30 . .	65- 85	18.6-24.3	$4\frac{1}{4}$
1/4 P. 30 . . .	75- 85	21.4-24.3	$6\frac{1}{2}$
1/3 P. 40 . . .	100-115	28.6-32.9	$8\frac{3}{4}$
1/2 P. (longue)	140-155	40.0-44.3	13

	White Wine		Vegetable Oil		Contents Weight
	Francs	U.S.¢	Francs	U.S.¢	Ounces
Herring:					
1/2 P. (longue)	240	68.6	200	57.1	13
1/4 Club 30 . .	140	40.0	n.a.	n.a.	$4\frac{1}{2}$

	Tomato and Oil		Contents Weight
	Francs	U.S.¢	Ounces
Pilchards:			
1/2 P. (Pilchards)	80-110	22.9-31.4	13

1/ Represent averages for stocks of the past two seasons. n.a. - not available.

Prospects: Because of exceptionally low production of fresh sardines in 1955 a deficiency has been accumulating in the stocks of canned sardine-type fishes which is expected to be 4,500 metric tons (below normal) as of the start of the 1956 selling campaign in August. The estimated amount of deficiency applies to both

Table 9 - France's Imports of Canned True Sardines,[1/] 1952-55

Item	Unit	1955	1954	1953	1952
Value--Total	Million Francs	5,066	4,452	5,582	5,354
Value--Total	US$1,000	14,474	12,720	15,949	15,297
Quantity--Total	Metric Tons	17,333	17,817	23,672	23,259
By Country of Origin:					
French Union . . .	Metric Tons	14,489	16,039	21,102	21,381
Portugal	" "	2,832	1,778	2,570	1,865
Other Countries .	" "	12	-	-	13

1/ Tariff Item 04-15-12, sardines, sprats, and anchovies.

cannery and wholesale stocks. The trade reports that the accumulating short supply position threatens to result in price increases which might be as high as 20 percent. Partial relief from this situation can be expected through a shift from true sardines to other sardine types but the leading beneficiary of such a shift in consumption pattern is more likely to be tuna which has a more stable market because

the catch is not subject to as many hazards as sardines. The situation appears in principle to call for an increase in imports of sardine-type fishes in the coming months.

So far as the prospects of imports from the United States are concerned, if prices are competitive the principal obstacle is likely to be the over-all Government program of regulation of dollar imports. It may be assumed that as large a part as possible of the additional requirements will be obtained from French Union sources, particularly North Africa. The Western European countries also enjoy advantage over the United States as a source of supply because under the system of reciprocal agreements imports from these countries are presumed to influence favorably the level of their imports from France, whereas the licensing of additional imports from the United States only add to France's already heavy dollar trade deficit.

Note: Values converted to US$ equivalents at the rate of 350 French francs equal US$1.

* * * * *

REVIEW OF THE FISHERIES, 1955: The French fish catch for 1955 (505,000 metric tons, including salt cod), was a record 15,000 tons over 1954. Deep-sea fish continues to provide the bulk, and the tonnage caught grows every year due to better conditions and improved techniques. Catches of other types of fish remained more or less stable.

Prices throughout remained stable and demand kept pace with increased quantities, because of the shortage of pilchards, herring, and tuna.

Imports of fresh fish were up by 2,500 tons in 1955, but salt and smoked imports fell. The importation of shellfish showed an important increase, due to its liberation from quota restrictions. One notable tendency was the increase in imported fillets, which jumped from 2,800 to 2,900 tons.

On the export side, salt cod continued to lead with 32,380 tons, but other types, including fresh fish, showed little or no increase, reports World Fishing of July 1956.

French West Africa

CANNED SARDINE MARKET: There is no local fishing for sardines and no sardine canning industry in French West Africa, states a June 27 dispatch from the United States Embassy at Dakar.

A good indication of the consumption of canned sardines in French West Africa is given by the imports for the first three months of 1956, which amounted to about 503 metric tons (valued at US$290,925). Morocco was the principal supplier with 485 tons, and the balance was supplied by France, Portugal, Algeria, West Germany, and Denmark. It is evident that data for such a short period do not reflect seasonal consumption trends. Consumption is probably increasing as Africans learn to enjoy European foods. In fact, lower quality, cheaper sardines (largely from Morocco) have a large sale among the Africans.

The most popular size of canned sardines is the 4½-oz. (125 grams) can. From time to time, one can obtain other sizes but by far the majority of the imports are the 4½-oz. size.

By far the most popular packing medium is refined peanut oil. A small percentage of the imports also are packed in tomato sauce and some of the higher-cost ones are packed in pure olive oil (from France and Portugal). There is also one brand of "luxury" sardines on the market from France packed with truffles and various spices. Packing with mustard sauce or brine is not popular locally.

A great majority of the imported sardines is consumed by the French residents (only 0.4 percent of the total population), although the few of the Africans who are beginning to acquire European tastes also buy them.

The retail market price for the 4½-oz. can of sardines packed in tomato sauce and in peanut oil from Morocco is 17 U. S. cents a can, and in peanut oil from Portugal is 20 cents. The same size can of high-quality sardines, skinless, boneless, and packed in pure olive oil from Portugal is 37 cents, and the same type pack from France is 49 cents. The price of the "luxury" quality sardines packed in pure olive oil with truffles, spices, and other condiments from France is 66 cents.

Because of the necessity to conserve foreign exchange, import permits and foreign currency are ordinarily not allowed for imports of food items. Imports from countries outside the French Union are allowed because they are included in barter trade agreements with France. Therefore, there does not at present appear to be a market for American exports to French West Africa. When a trade agreement has been concluded between France and other countries providing for imports of sardines, a public notice is given asking all importers interested in buying from that country to notify the Government authorities as to the amounts they wish to purchase. Allocations of import permits are then made proportionately to the total quantity to be allowed.

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ALBACORE TUNA FISHING: Commercial fishing for tuna in French West Africa was started late in 1955. From November 30, 1955, to May 20, 1956, the catch was 1,700 metric tons of albacore tuna, points out a July 30 dispatch from the United States Consulate at Dakar. This tonnage compares with the results shown in France by a port such as Douarnenes (1,980 tons of tuna during the last season), but the fish from tropical waters is considered superior. At Douarnenes 96 boats fished for tuna while at Dakar only 7 boats caught the amount indicated.

German Federal Republic

INAUGURATION OF 1956 DEEP-SEA FISHING SEASON: The fourth annual postwar "Day of the Deep-Sea Fisheries" was held in Cuxhaven July 14-15 to celebrate the opening of the West German fishing season. Guests included high Federal and Land officials and foreign government representatives. A series of ceremonies and celebrations highlighted the official opening of the 1956 West German fishing season. This year the event took place in Cuxhaven, one of the four major home ports of the West German trawler fleet. The month of July is chosen for the event because trawler companies have then finished the annual over-haul of a large part of their fleet in preparation for the herring season.

The opening of this year's deep-sea fishing season began July 14, 1956, with a religious service in memory of the fishermen who lost their lives on the high seas during the past year. There followed a tour of inspection of the fishery port of Cuxhaven, the West German fisheries research vessel Anton Dohrn, and of the visiting Belgian and Dutch fisheries service vessels.

Federal Minister Dr. von Merkatz stated that the Federal Government intends to continue its active support of the West German deep-sea fisheries, mentioning in this regard the current improvement of the government's fisheries protection service. He also recommended that steps should be taken to intensify the training and education of young fishermen. At a press conference Dr. Dierks, executive manager of the Federal Association of Deep-Sea Fisheries, announced that DM450,000 (US$107,000) are being allocated to such a training center for groups of 240 prospective fishermen. The school will be located in Bremerhaven.

With regard to future developments in the fishing trade the tenor of the speeches was that government intervention should be kept to a minimum. The most important task facing the trade today, according to the speakers, is the improvement of the quality of fish products so as to develop a greater outlet for an increasing production by the German fisheries, according to the United States Consulate at Bremen (July 30, 1956).

Gold Coast

CANNED SARDINE MARKET: It is impossible to obtain statistics on sardine consumption in the Gold Coast, according to a United States Embassy dispatch of June 21, from Accra.

Sardine consumption has always been high with the African population who use them in mixtures of rice and other local crops in the preparation of native dishes. Tall and rectangular cans are seldom found in stores, the 4½-oz. flat and 8-oz. oval are the popular sizes. The most popular medium of packing is in oil, generally vegetable, as this lends itself well to the preparation of the native dishes. It is estimated that better than 95 percent of the sardines sold in the Gold Coast are packed in oil and are consumed by the low-income group. They prefer the cheaper vegetable-oil pack, as olive oil is more expensive.

The Gold Coast is a member of the sterling area, and in accordance with the monetary policy of that area, unrestricted expenditure of dollars on goods readily available from within the sterling area or from O.E.E.C. countries is not permitted. On occasions, surplus of dollars permit sporadic importation from the United States of items such as canned fish, but this trade should not be considered as an important export outlet for American producers.

Practically all distribution is through extremely large concerns. These concerns sell in quantity to "Mammy Traders," who receive a commission from the large dealers and they in turn sell to lesser traders. These products eventually reach the most primitive areas of the country. The National Government and the Gold Coast Armed Forces occasionally ask for tenders on large quantities of foodstuffs.

Iceland

FISHERIES TRENDS, JANUARY-JULY 1956: The Icelandic North Coast herring season as of June 30, 1956, was three times that of last year, and the summer ocean perch fishing was excellent, points out a United States Embassy dispatch (August 9) from Reykjavik. The total Icelandic fish catch through July 31 this year was 321,000 metric tons in comparison with 286,000 tons for the same period in 1955. Herring accounted for most of the increase. The outlook for frozen fish shipments to the United States is reported as somewhat improved.

The larger-than-usual carryover of export stocks of fishery products existing at the end of 1955 was eliminated during the first half of 1956 since exports were 24 percent higher than in the same period a year earlier. Stocks as of June 30 were at approximately last year's level. Most of the increase in exports was in shipments of frozen fish, with the bulk of the increase destined for the Soviet Bloc. It is reported that 84 percent of Iceland's total Soviet Bloc trade was in frozen fish.

Iceland herring exports.

The only other volume market for frozen fish continued to be the United States. Exports of frozen fish to the United States has increased from 6,000 metric tons for the first half of 1955 to 7,200 tons for the first half of this year. On the other hand, frozen fish shipments to the Soviet Bloc increased from 16,000 tons to 22,300 tons during the same period. While shipments to the United States are up, sales may or may not be since frozen fish is actually sold ex-warehouse after it arrives in the United States. The increased shipments may reflect in part the tight storage situation in Iceland.

Table 1 - Iceland's Estimated Production of Frozen Fish, January-June 1956

Species	Quantity
	Metric Tons
Cod fillets	24,172
Haddock fillets	1,906
Ocean catfish fillets	902
Ocean perch fillets	5,208
Coalfish fillets	396
Ling fillets	53
Flounder fillets & whole frozen	167
Total January-June 1956	32,904
Total January-June 1955	33,175

LARGE NUMBER OF FILLETING AND SKINNING MACHINES PURCHASED: Iceland will receive delivery of 17 automatic filleting and skinning machines in 1956 and 40 in 1957. These are being purchased under a DM7-8 million (US$1.7-1.9 million) export credit obtained in Western Germany. Since each of these machines will replace 18 to 20 high-cost filleters, this acquisition should constitute a significant step towards lowering costs and improving Iceland's competitive position in frozen fish. It will also, presumably, increase total output and, unless exports improve, aggravate the frozen stocks problem.

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NEW TRAWLERS ORDERED FROM WEST GERMAN SHIPYARD: The City of Reykjavik has contracted with a West German shipyard in Bremerhaven to build, for delivery early in 1958, Iceland's largest trawler. The new 800-ton vessel will carry a crew of 48 men and cost close to US$774,908 (IKr. 12.6 million). A similar contract was signed in the spring of 1956 by the town of Neskaupsstadur. The two new trawlers will replace two that were wrecked in 1955. The additions will bring the trawler fleet up to 46 vessels, states a July 6 United States Embassy dispatch from Reykjavik.

The Bremerhaven shipyard was selected over the shipyards of several other countries because of favorable terms and quicker delivery.

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NORTH COAST HERRING SEASON: The previously booming North Coast herring season blew away on July 25 in a blast of Arctic wind that lasted ten days and deposited snow on Iceland's northern passes. As a result the herring overnight deserted the surface and the Icelandic hopes for its return en masse are waning.

Whereas the catch in the single week ending July 21 was about 30,000 metric tons, that for the following week was 11,000, and that for the week ending August 4 only 1,000. The weather improved, but the catches did not and increasing numbers of boats were reportedly giving up and departing for the South Coast.

Icelandic North Coast Herring Catch Through August 4, 1956, with Comparisons

	1956		1955	
	Barrels	Metric Tons	Barrels	Metric Tons
To reduction plants	244,894	33,061	22,087	2,982
For salting	257,003	34,695	155,773	21,029
For freezing	9,394	939	8,017	802
Total	511,291	68,695	185,877	24,813

An additional contract for 50,000 barrels of salted North Coast herring has been signed with the Soviet Union and accordingly salting operations (for such herring as is now being caught) have been resumed. The final total of North Coast contracts stands as follows: U.S.S.R. 150,000 barrels; Sweden 60,000-70,000 barrels; and Finland 75,000 barrels. Other sales will be so small as to be almost negligible.

The South Coast herring season began and first catches were reportedly good. Contracts in hand total 60,000 barrels, or 25,000 less than last year. This results from the fact that 25,000 barrels of the Russian South Coast contract was, as the contract authorized, filled with North Coast herring. At present the orders stand: 50,000 barrels for the U.S.S.R., and 10,000 barrels for Poland.

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REVIEW OF THE FISHERIES, 1955: The total Icelandic fish catch of 1955 was 409,000 metric tons, 5.5 percent above 1954. Apart from herring, the total fish catch was greater than in any previous year. The increase was due mainly to the ocean perch catch by the trawlers which rose about 21.2 percent as compared with 1954. At the same time the motor fishing boats increased their total catch by 6.3 percent as compared with 1954. Despite the fact that the herring season of 1955 in North Iceland gave very poor results, the herring catch proved to be 10.4 percent above the 1954 catch when the herring season was a total failure. The herring fisheries off the south and west coast of Iceland gave fairly good results and lasted longer than in many a previous year.

Principal changes in fish processing: the salt-fish production rose by nearly 24 percent and the production of stockfish by about 12.5 percent, but the production of frozen fish dropped by 5 percent.

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WINTER FISHING SEASON, 1956: The catch during the first two months of 1956 was considerably below the same period of 1955, and slightly lower than in 1954. The total catch was 23.9 percent below the first two months of 1954, the trawlers doing considerably worse than the motor fishing boats. The reduced trawler catch, however, was due to the fact that the season did not begin until January 24. In February the trawler catch was well above February 1954.

The trawlers the early part of 1956 had by and large had a poor season, both on account of unfavorable weather conditions and poor catches. The situation did improve about the middle of April, however.

The delay in the start of the season was due to the fact that the operators of the trawlers declared that they were not in a position to operate their vessels be-

cause of rising operational costs. Accordingly they sought a new agreement with the Government for a more favorable working basis for their vessels. As no agreement was forthcoming at the end of 1955, there was a stoppage which lasted until January 24. The new agreement, reached on January 21, provided for special measures in support of the fisheries, says the January-April issue of Fjarmalatidindi.

India

DRIED SHRIMP INDUSTRY FACING CRISIS: The century-old shrimp industry of Kerala (Travancore-Cochin and Malabar) is facing a crisis as a result of the Government of Burma's complete ban on imports of dried prawns from outside Burma except from the mainland of China, effective July 3, 1956.

For over 80 years Burma has been the chief customer of Kerala's shrimp, consuming about 90 percent of Kerala's annual production of about 10,000 metric tons. But in recent years, owing to the shifting of Burma's import policy from time to time, placing shrimp on the open general license list at one time and on the restricted license list at another, the fortunes of the Kerala shrimp industry have been fluctuating. A Burmese Purchasing Mission visited India in February 1956 and the orders placed by the Mission included dried prawns worth Rs. 24 lakhs (US$504,000). This order reportedly helped the clearance of accumulated stocks of dried prawns in Kerala.

The President of the Travancore-Cochin Prawn Curers' Cooperative Marketing Society[1/], a prominent society engaged in the trade, in a recent statement issued to the press, has brought out the serious situation in the trade at present. He stated that with Burma's latest order totally banning all imports of dried prawns except from China, with the season for the catch of shrimp now in full swing on the west coast and with a contract entered into by Burma with the Society expiring on July 31, 1956, the shrimp industry was facing a crisis.

The Society President clarified a misunderstanding in certain quarters that the trade in shrimp could easily be directed to the United States, which had started to buy large quantities of Indian shrimp. He explained that America was taking large-size frozen and raw shrimp, while the Burmese market's demand was for ordinary dried small shrimp. He added that shipments of shrimp to America were started only last year and lack of cold storage and other facilities had hindered development in that direction.

The Madras State Fisheries Marketing Officer explained that shrimp shipped to Burma belong to a particular species, very small compared to the large shrimp exported to the United States and that it was naturally impossible for that particular variety to grow bigger in size to suit the latter trade.

1/ The Travancore-Cochin Prawn Curers' Cooperative Marketing Society has a membership of 300 with a share capital of Rs.30,000 (US$6,300). One-third of the total exports of prawn in 1954/55 season was done through the society. The society pays 75 percent of the market rate to the producers and curers at the very initial stage, payment being completed after sales.

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FIRST FREEZER VESSEL TO HANDLE SHRIMP: The first quick-freezing vessel to operate along the west coast of India has arrived in Bombay from the United States, points out the July 1956 World Fishing. This 115-ton vessel, the M/V Judith, has a quick-freezing capacity of 4 tons a day and additional cold-storage facilities for approximately 70 tons of fish. It has been commissioned by an Indo-American venture.

The vessel will be completely manned by Indian personnel, and will move from port to port along the coast, collecting fish and freezing it on the spot. The main catch will be shrimp. In many cases she will deliver her cargo directly to ocean-going vessels destined for foreign ports, but some will be unloaded at cold-storage plants on shore operated by the company.

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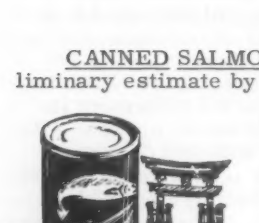
NEW FISH FREEZING PLANT PROPOSED: The installation of a quick-freezing plant for preserving fish near Quilon, Travancore-Cochin, India, was announced recently by the Director of the Indo-Norwegian Fisheries project at Neendakara. He estimated the total cost of the freezing plant and the ice factory now under construction at Rs.500,000 (US$105,000). The ice factory with a capacity of 25 tons of ice a day is expected to store 300 to 400 tons of fish at a time.

A fishery expert of the Norwegian Foundation, who had been away on a three-week visit to the United States for exploring the market for Indian west coast shrimp, was returning to Quilon, reports a United States consular dispatch (August 2) from Madras.

Japan

CANNED SALMON PACK AND SALES PLAN FOR 1956: According to a preliminary estimate by the Japanese fishing industry, approximately 2 million cases of canned salmon are expected to be packed by the industry this year. Floating canneries or mothership operations are expected to pack 1,620,000 actual cases; shore canneries are expected to pack from coastal salmon 250,000 cases and from high-seas salmon 150,000 cases; a grand total of 2,020,000 cases.



The carryover from the previous year's pack amounts to some 100,000 cases, making a total available for sale of approximately 2,120,000 cases of which 1,700,000 are expected to be exported and 400,000 cases to be sold on the domestic market. Members of the industry indicate that the outlook for placing the entire amount available is good both on the export and domestic markets. It is estimated that approximately 500,000 cases will be sold in the United States and the same amount in the United Kingdom and 700,000 cases to all other countries, reports an August 24 United States Embassy dispatch from Tokyo.

Type	August 1956	Average 1955
	(Per Case of 48-1-lb. Cans)	
Chum .	$16.75	$14.00
Pink . .	18.00	16.50
Silver .	24.00	24.00
Red . .	31.00	30.00

This year's pack had been estimated at 3 million cases before the Russian restrictions were placed on fishing in the North Pacific and Okhotsk Seas. Last year's pack amounted to 1,780,000 cases. Comparative f.o.b. prices for 1956 and 1955 for canned salmon are found in the table.

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Fishing Area	Catcher Boats	Motherships
Okhotsk	59	2
East of Kamchatka.	447	14
South of 48° N. . .	509	-

NORTH PACIFIC HIGH SEAS SALMON FISHING DEVELOPMENTS: The number of Japanese motherships and catcher boats reported to have received valid fishing licenses from the Russians to fish in the Russian restricted area is as shown in the above table.

The total salmon catch in the unrestricted area of the Aleutians and Bering Sea, according to unofficial sources, amounted to 25 million fish as of July 20. Official figures on the catch have not been released, points out an August 14 United States Embassy dispatch from Tokyo.

The total quota of 65,000 metric tons allowed in the Russian restricted area was not filled by the August 10 deadline. The Japanese Government had earlier requested an extension of the deadline in case quotas were not filled.

The Soviet Union through its Fisheries Mission in Tokyo gave a negative reply to Japanese requests for an extension of the August 10 deadline for salmon fishing in the Russian Restricted Area in the North Pacific and Okhotsk Sea and Japanese fleets were ordered to return to their home ports. Only two fleets out of a total of 16 that participated returned to port with full quotas. These two had operated in the Okhotsk Sea. The remaining 14 fleets operating in the area East of Kamchatka fell short of filling their quota for the area by four million salmon. Failure to fill the quota is attributed to the fact that the Russians delayed in granting licenses, so that there were only 27 days of fishing before the August 10 deadline.

Fishing Area	Millions of Fish
Mothership Operations:	
Okhotsk Sea	10.9
North of 48° N. latitude, east of Kamchatka (Aleutians) . .	18.0
Shore-based Fishing Boats:	
South of 48° N. latitude in restricted area	6.5
Total Russian Restricted Area	35.4
Mothership Operations:	
Aleutian and Bering Sea . . .	25.0
Shore-based Fishing Boats:	
Coastal Waters.	6.5
South of 48° North Latitude in Unrestricted Area	9.0
Total Unrestricted Areas . .	40.5
Total Both Areas.	75.9

One fleet of one mothership and 27 catcher boats, which had operated in the Kurile Straits area, returned to port on July 30 with its limit, reported to be worth ¥410,000,000 (US$1,137,000).

The Japanese 1956 pelagic and coastal salmon catch according to unofficial sources will be approximately as shown in the above table.

The following table gives official figures of the Japanese salmon catch by North Pacific mothership-type fishing only, by species, as of July 31, 1956.

Species	1,000 Fish
Red	9,060
Chum . . .	19,140
Pink . . .	15,000
Silver . . .	3,250
King	120
Total . .	1/46,570

1/ Excludes the coastal salmon catch and the catch by land-based catch-boat operations.

The catch by mothership-type operations for 1956 was some 12 million salmon short of the mothership-type catch by 14 floats last year. While the catch is smaller than during the previous year with a larger total investment for the fishing companies and while the fleets failed to fill their quotas in the restricted area by four million salmon, the recent increase in salmon prices (up to 20 percent for salted and frozen fish and 5 percent for canned fish) may counteract the smaller catch.

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COSTS OF JOINT UNITED STATES-JAPANESE CANNED TUNA ADVERTISING STUDIED: The Japanese Fisheries Agency has hired Dentsu & Co., an international advertising firm, to study costs and other aspects of the proposed joint United States-Japanese tuna advertising campaign in the United States. The firm is compiling statistics on tuna imports, production, and consumption together with information

on the ways canned tuna is served in the United States. The Fisheries Agency reported that details of the agreement have not yet been settled but information is being gathered which will be helpful in any subsequent developments relating to the scheme, states a United States Embassy dispatch from Tokyo dated August 10, 1956.

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CANNED TUNA EXPORTS TO UNITED STATES: The Japanese Government announced that as of August 11 validations of tuna exports destined for the United States would be suspended. It is understood that the suspension is for the purpose of developing a new quantitative allocation for each exporter, which is currently under discussion between the exporters and the Government and will be based on exports since 1950.

A quota of 1.6 million standard cases will be shipped to the United States between August 1956 and July 1957 and will be divided among 44 exporters who have export records. Hitherto canned tuna exports to the United States were controlled by eight major firms and the balance to the other firms, points out an August 10, 1956, United States Embassy dispatch from Tokyo.

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MEASURES TAKEN FOR ORDERLY MARKETING OF CANNED TUNA TO UNITED STATES: The Japanese Government is taking measures to assure the orderly marketing of canned tuna to the United States. Heretofore producers who are not members of the Canned Tuna Export Association were under no direct control. The new system restricts production by nonmembers of the Association to 20,000 cases for export to the United States market out of a total production allocation of 1,620,000 standard cases for the United States market in Japanese fiscal year ending July 1957. Only canned tuna in brine will be authorized for shipment to the United States.

Slicing tuna for canning in cannery located in Hiroshima, Japan.

At the same time allocations will be made to exporting firms on the basis of each one's historical position as supplier and on the basis of ability to perform. While the number of exporters is potentially as high as 44, it is expected that many will have allocations too small to be commercially practical and their export rights will probably be sold to major exporters (permitted under the regulation). Hence the final number of exporters may not greatly exceed last year's total of 14. All sales to exporters are to be channeled through the Tokyo Tuna Sales Company subject to provisions of the Fisheries Export Promotion Law regarding prices and sales methods. Japanese believe regulations will prevent price cutting in United States market.

Canned tuna export permits were suspended until regulations are legally processed, scheduled about the end of August, states an August 25 report from the United States Embassy in Tokyo.

According to the Japan Canned Fish Exporters Association, during the year which ended July 31, 1956, a total of 1,450,000 cases of canned tuna in brine were exported to the United States and 560,000 cases of tuna in oil to Europe.

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TUNA FISHERIES RESEARCH COUNCIL ESTABLISHED: A tuna fisheries research council consisting of 25 members, all of whom are experts drawn from various sectors interested in tuna, including universities, has been organized by the Japanese Ministry of Agriculture and Forestry. The Council will study and carry out research on tuna resources, production, and sales as they relate to the Japanese economy, states a August 24 dispatch from the United States Embassy in Tokyo.

The establishment of the council grew out of a realization that an over-all clear-cut policy on tuna fishing from catch to consumption is a pressing need both for the industry and for the Japanese economy. Such a policy, the Government feels, is essential to the stable development of the industry. The Council's emphasis in its initial stages will be on matters concerning the conservation of resources and the development of new ones. The Council will also give consideration to helping the industry improve productivity, expand domestic sales, and increase the export of tuna products. The new organization should not be confused with the Tuna Export Council, which was organized by the tuna industry on a private basis and handles export matters with the United States.

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TUNA VESSELS TO FISH IN AFRICAN WATERS: The Japanese are sending fishing vessels to African waters to catch tunny, and Prof. J. L.B. Smith, the ichthyologist, of Rhodes University, Grahamstown, Union of South Africa, has suggested that African territories should combine to arrange for part of the Japanese catch to be sold in Africa. His plan is that a refrigerator ship should cruise among the Japanese fishing craft off the coast and buy fish for South Africans. Both sides might make a good bargain.

Professor Smith holds that too much South African fishing is of the inshore type, and has suggested that South Africa employ a group of Japanese to pass on their highly developed skills and knowledge to the home industry, announces the July 1956 World Fishing.

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FISHERY PRODUCTS LEAD IN FOOD PRODUCTS EXPORTED TO UNITED STATES IN 1955: Fishery products were among the leading food products exported to the United States by Japan in 1955. According to the Japanese Ministry of International Trade and Industry, food products exported from Japan in 1955 had a value of US$93.1 million. Of this total there were exported to the United States products valued at US$37.6 million, almost 40 percent of the dollar value of the total Japanese food exports. The importance of the United States as an outlet for frozen and canned tuna is brought out in the table.

Japan's Food Exports to the United States Compared with Total Food Exports in 1955

Commodity	Total Japanese Exports		Exports to United States	
	Qty.	Value	Qty.	Value
	Metric Tons	1,000 US$	Metric Tons	1,000 US$
Frozen tuna	64,951	19,860	55,027	17,548
Dried cuttlefish	10,325	2,924	13	11
Canned salmon or trout	12,704	11,671	4,057	3,047
Canned tuna	12,502	11,040	9,439	8,871
Canned crab	4,155	7,965	2,095	4,464
Fresh mandarin orange	10,082	1,854	-	-
Canned " "	40,284	14,666	4,730	1,701
Dried mushroom	980	2,229	91	326
Tea	14,494	9,750	1,464	1,060
Glutamin soda (Adjinomoto flavor)	3,798	9,580	245	553
Wheat flour	16,031	1,517	-	-
Total	190,306	93,056	77,161	37,581

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MARINE FISHING FLEET: As of December 31, 1955, a total of 385,722 powered and nonpowered vessels were engaged in the marine fisheries of Japan, according to the May 1956 Monthly Statistics Report of Japanese Fisheries.

Table 1 - Number of Powered and Nonpowered Vessels Engaged in the Japanese Fisheries by Type of Fisheries, December 31, 1955

Type of Fisheries	Grand Totals		Nonpowered		Powered		
	No. of Vessels	Gross Tonnage	No. of Vessels	Gross Tonnage	No. of Vessels	Gross Tonnage	Horse-power
Grand total	385,722	1,314,721.69	243,457	247,436.98	142,265	1,067,284.71	2,833,689
Tidal inland waters	3,530	3,458.58	2,765	2,390.59	765	1,067.99	3,841
Shellfish and aquatic plants	67,175	51,269.89	57,843	33,042.91	9,332	18,226.98	55,069
Fixed-net	16,228	55,240.42	12,191	40,005.65	4,037	15,234.77	47,160
Pole-and-line	101,498	138,874.88	63,048	43,880.68	38,450	94,994.20	341,912
Long-line	23,027	64,670.25	6,151	5,103.56	16,876	59,566.69	187,438
Gill-net	24,344	116,294.09	13,464	15,987.92	10,880	100,306.17	213,661
Purse-seine (netting vessel)	5,180	70,408.76	2,392	11,179.20	2,788	59,229.56	199,060
Auxiliary purse-seine vessel	8,225	53,081.60	2,747	8,409.32	5,478	44,672.28	146,565
Square-net	8,494	33,847.20	4,316	7,657.01	4,178	26,190.19	84,939
Smaller trawler	19,879	116,750.21	-	-	19,879	116,750.21	368,179
Medium trawler west of 130° E.	810	63,283.84	-	-	810	63,283.84	164,595
Otter trawler	51	19,492.10	-	-	51	19,492.10	31,910
Miscellaneous drag-net	27,495	61,168.30	19,704	34,615.39	7,791	26,552.91	95,476
Tuna and skipjack	1,825	176,243.47	-	-	1,825	176,243.47	397,415
Whaling	117	69,623.16	-	-	117	69,623.16	125,723
Government vessels	469	18,763.03	87	145.91	382	18,617.12	44,998
Fish carriers	5,970	125,234.65	1,093	1,647,56	4,877	123,587.09	210,694
Miscellaneous fishery	65,789	73,501.86	52,277	40,128.58	13,512	33,373.28	113,954
Sport fishing vessel	5,616	3,515.40	5,379	3,242.70	237	272.70	1,100

A total of 142,265 powered vessels were engaged in the marine fisheries, of which 115,640 were under 5 gross tons and only 296 were over 299 gross tons.

Table 2 - Number of Powered Vessels Engaged in the Japanese Marine Fisheries by Gross Tonnage and Type of Fisheries, December 31, 1955

Type of Fisheries	Grand Total		Under 5 Tons		5-19 Tons		20-99 Tons		100-199 Tons		Over 200 Tons	
	No. of Vessels	Gross Tonnage	No. of Vessels	Gross Tonnage	No. of Vessels	Gross Tonnage	No. of Vessels	Gross Tonnage	No. of Vessels	Gross Tonnage	No. of Vessels	Gross Tonnage
Grand Total	142,265	1,067,284.71	115,640	208,805.77	19,190	209,550.73	6,685	327,889.32	474	70,304.19	296	250,734.70
Tidal inland waters	765	1,067.99	762	1,044.83	3	23.16	-	-	-	-	-	-
Shellfish & aquatic plants	9,332	18,226.98	9,231	15,724.09	74	502.03	26	1,303.42	-	-	1	697.44
Fixed-net	4,037	15,234.77	3,150	6,851.21	884	8,273.42	3	110.14	-	-	-	-
Pole-and-line	38,450	94,994.20	35,295	49,108.07	2,768	30,307.49	385	15,330.01	2	248.63	-	-
Long-line	16,876	59,566.69	14,369	25,764.40	2,230	23,015.38	277	10,786.91	-	-	-	-
Gill-net	10,880	100,306.17	7,931	16,049.72	2,462	35,758.95	480	23,024.04	1	105.41	6	35,368.05
Purse-seine (netting vessel)	2,788	59,229.56	691	1,946.29	1,054	14,605.28	1,035	41,368.05	7	1,105.51	1	204.43
Auxiliary purse-seine vessels	5,478	44,672.28	3,174	8,439.24	1,946	23,459.43	358	12,773.61	-	-	-	-
Square-net	4,178	26,190.19	3,255	7,167.12	613	5,598.80	310	13,424.27	-	-	-	-
Smaller trawler	19,879	116,750.21	16,039	34,821.08	2,424	23,729.08	1,416	58,200.05	-	-	-	-
Medium trawler west of 130° E.	810	63,283.84	-	-	-	-	791	61,004.03	19	2,279.81	-	-
Otter trawler	51	19,432.10	-	-	-	-	-	-	-	-	51	19,492.10
Miscellaneous drag-net	7,791	26,552.91	6,724	15,222.81	1,063	11,229.91	4	100.19	-	-	-	-
Tuna and skipjack	1,825	176,243.47	70	151.79	334	4,440.78	868	58,603.53	415	62,257.52	138	50,789.85
Whaling	117	69,623.16	6	25.48	38	541.25	19	600.26	2	252.42	52	68,203.75
Government vessels	382	18,617.12	157	350.38	94	1,016.48	102	4,838.41	15	2,249.39	94	10,162.46
Fish carriers	4,877	123,537.09	2,107	5,854.78	2,233	26,922.15	501	23,188.04	13	1,805.50	23	65,816.62
Miscellaneous fishery	13,512	33,373.28	12,442	20,011.78	980	10,127.14	90	3,234.36	-	-	-	-
Sport fishing vessel	237	272.70	237	272.70	-	-	-	-	-	-	-	-

* * * * *

NUMBER AND TYPE OF OPERATORS IN THE MARINE FISHERIES: The second Japanese fisheries census after the World War II was made in January 1954, and its results were made public recently, according to the June 1956 Monthly Statistics Report of Japanese Fisheries. Some aspects of the operating structure of Japanese fisheries as revealed by the census are shown in table 1.

Table 1 - Number of Operators Engaged in the Japanese Marine Fisheries, 1953

	Total	Non-Powered Vessels	Powered Vessels by Gross Tonnage									Fixed Nets		Beach Seines	Shallow-Seas Aqui-culture
			Under 1	1-3	3-5	5-10	10-20	20-30	30-100	100-200	200 Up	Large Type	Small Type		
	(Number)														
Grand Total	251,747	116,205	14,055	48,179	8,108	6,815	4,802	1,364	2,810	641	253	2,166	8,418	4,288	83,603
Individuals	236,015	113,777	13,848	46,327	6,905	5,117	3,541	882	1,549	267	95	1,113	6,784	2,669	33,141
Fishermen's Cooperatives	552	92	2	23	12	45	37	17	57	13	2	90	59	37	66
Fishermen's Production Associations	246	6	1	3	1	7	28	25	72	8	2	60	23	4	8
Joint operators	13,869	2,322	202	1,822	1,182	1,622	1,130	387	778	165	31	833	1,538	1,572	285
Companies	960	2	1	1	5	22	51	51	318	180	154	69	14	6	86
Governments, schools, & Laboratories	105	6	1	4	3	2	15	2	36	8	9	1	1	-	17

The fishing industry in Japan is operated by three types of management: (1) individuals, (2) companies, and (3) joint operators including cooperatives.

Marine fisheries industry in Japan is operated by 251,747 persons in all, of which 236,015 or 93.8 percent belong to the first type (i.e. individuals), while only 15,732 or 6.2 percent to the second and third types (i.e. companies, and joint operators including cooperatives.

The ex-vessel value of the annual production by the 251,747 fisheries operators for 1953 was 134.0 billion yen (US$372.2 million), of which 128.4 billion yen (US$356.7 million) was through general marine fisheries; and 5.6 billion yen (US$15.5 million) through shallow-seas aquiculture.

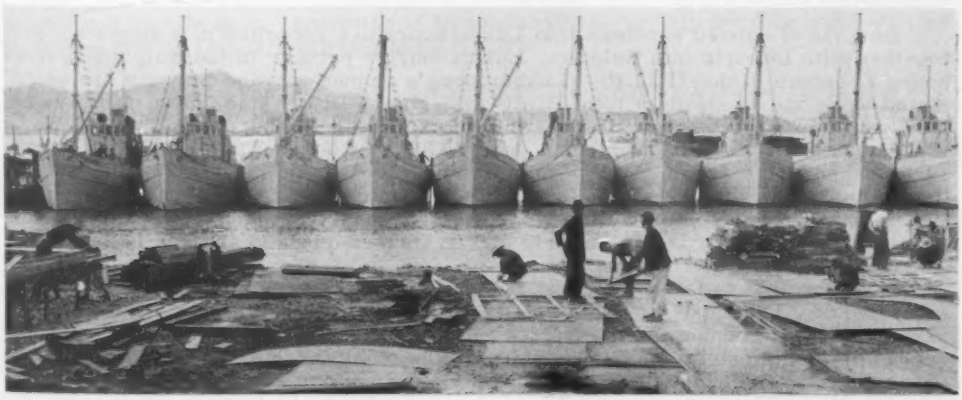
Table 2 - Japanese Fisheries Data, 1953

	Totals	Percentage for Each Type of Operator				
		Individuals	Coops. & Ass'ns	Joint Operators	Companies	Total
	No.	(Percent)				
Fisheries operators	251,747	93.8	0.3	5.5	0.4	100.0
Persons engaged in fisheries	1,162,875	69.5	3.8	20.8	5.6	100.0
Powered vessels	110,974	89.0	0.9	6.6	3.4	100.0
Gross tonnage of powered vessels	775,121 tons	51.3	1.8	11.3	34.8	100.0
Ex-vessel value of catches	¥134 billion	50.6	3.1	19.2	26.8	100.0

With regard to the earnings by operators, 50.6 percent of the total value went to individuals and 49.4 percent (26.8 percent of this was received by companies which make up only 0.4 percent of the number of operators) to other types of operators.

Republic of Korea

FISHERY FIRM BUYS TRAWLERS IMPORTED BY UNKRA: Ten 77-ton motor fishing trawlers ordered for Korea by the United Nations Korean Reconstruction Agency have been purchased by a new Korean fishery concern which made the successful bid of 280,000,000 hwan (US$560,000) for the vessels.



Trawlers originally purchased by UNKRA to aid the Korean fishing industry have now been purchased by a new Korean fishery firm.

Built in Hong Kong and brought to Korea by UNKRA at a cost of some US$610,000, the trawlers were provided as part of an over-all program undertaken by the Agency to re-establish the country's war-damaged fishing industry.

After their completion the trawlers sailed under the United Nations flag--the first vessels ever to do so--from the shipyard in Hong Kong to their anchorage at Pusan. Ownership was then formally transferred to the Korean Government by the UNKRA Agent General. Now, following their purchase, the trawlers have been transferred from the Korean Office of Supply to the Korean fishery concern.

Designed and built by a shipyard of Hong Kong in accordance with plans approved by the Korean Government, the ships have an over-all length of 75 feet 7 inches, and are equipped with British-manufactured 2-cycle, 180-horsepower marine Diesel engines.

They carry a crew of 12 to 15 and were designed to be especially suitable for fishing in Far Eastern waters.

Liberia

IMPORT DUTIES ON FISHERY PRODUCTS LOWERED: Liberia has lowered its import duties on certain fishery products, reports the United States Embassy at Monrovia. The fishery tariff items affected, the new specific rates, and the old duties (shown in parentheses) were:

Smoked or dried fish packed in airtight containers, 4 cents a pound (6 cents).

Fish or fish products packed in airtight containers, 4 cents a pound (6 cents).

Luxembourg

CANNED SARDINE MARKET: Imports are the only source of canned sardines in Luxembourg, states a July 20 dispatch from the United States Embassy at Luxembourg.

Imports of canned sardines into Luxembourg are recorded in a single account together with imports into Belgium, Luxembourg's partner in the Belgian-Luxembourg Economic Union (BLEU). Luxembourg's canned sardine imports are estimated to be one-thirtieth of total BLEU imports. BLEU's imports of sardines in 1955 amounted to US$2.7 million of which Luxembourg's share would amount to US$90,000. Of total BLEU imports during 1955, 73 percent came from Portugal, 14.6 percent from Japan, 11.9 percent from United States, and 0.5 percent from the Netherlands. In addition, a negligible percentage of the sardines consumed in Luxembourg were supplied by the small Belgian industry. (Goods brought in from Belgium are not regarded as imports and no figures on them are available.)

Sardines sold in Luxembourg in flat cans are in three sizes: 4.4-oz.; 8.8-oz.; and 17.6-oz. Pilchards are also sold in an 8.8-oz. oval can. An estimated 80 percent of local consumption is packed in 4.4-oz. flat cans. The remaining 20 percent is divided more or less equally among the other three sizes. Seventy percent of the canned sardines consumed in Luxembourg are packed in olive oil; the remaining 30 percent in tomato sauce. Canned sardines are popular among low income groups.

Retail prices of canned sardines in the 4.4-oz. flat can range from 22-36 U.S. cents a can; 8.8-oz. can, 44 cents; 17.6-oz. can, 70-76 cents; and the 8.8-oz. oval can, 35 cents.

Imports to Luxembourg would ordinarily be through a Belgian importer with an agency responsibility for both Belgium and Luxembourg, who would in turn supply a subagent in Luxembourg. Consequently, any efforts to increase United States imports would have to be made through Belgian importers.

There are almost no direct imports of canned sardines from producing countries, principally because of the small population of the Grand Duchy which amounts to only about 309,000. Imports enter BLEU through Belgium. The Luxembourg wholesaler obtains his supplies through the Belgian importer or wholesaler and then distributes to the various retailers. In the Luxembourg food supply field, there are about 30 wholesalers of any importance and some 2,000 retailers.

Malaya

DEVELOPMENT OF SEA FISHERIES UNDER WAY: About 40 Japanese fishermen, employed by a Singapore firm, will train Malayan youths in Japanese methods of fishing, according to a report from the United States Agricultural Service dated July 23. The report states that initially 70 candidates will undergo a two-year course under the expert Japanese fishermen whom they are expected to replace eventually. In the first year the trainees will be taught the theoretical part of the fishing industry and spend the second year doing practical work at sea. The Singapore fisheries Department is believed to have approved the plan.

The plan of the Chinese firm backing the venture includes, in addition to the development of the deep-sea fisheries, a plan for a shore plant to can and salt fish for local consumption as well as for export.

Other developments include the motorization of fishing craft with outboard motors. The addition of motors has increased the catch of the motor-equipped boats by 60 percent, according to the Chief Fishery Officer of Singapore. The Singapore government has assisted the fishermen in mechanizing their craft with the help of a loan fund of US$133,000. At the present there are 550 outboard motors as compared to 100 before establishment of the loan fund. The Fishery Department maintains a mobile unit, consisting of two mechanics, to help service and teach the fishermen how to repair their outboard motors.

Two exploratory vessels are maintained by the Singapore Government and British Government to locate and survey new fishing grounds in Southeast Asia. A 500-ton yacht is being used for a trawling survey and also as a floating laboratory in the South China sea. The other craft of 100 tons is carrying out a fishing survey in Malayan waters. New fishing grounds if and when discovered are made known to the fishermen.

* * * * *

JAPANESE FIRM STUDIES POSSIBILITIES OF PEARL CULTURE: A Japanese fisheries company was reported in the Singapore press as undertaking a study of pearl culture in Malayan waters. A representative of the Japanese firm said there were promising locations for pearl culture near Penang and Singapore and that some of the species of clams used in pearl culture in Japanese waters are also found in Malaya. It is expected that an application for a license to operate would be made soon by the Japanese firm, states a dispatch (July 30) from the United States Consul General in Singapore.

Mexico

JAPANESE-MEXICAN FISHING COMPANY PLANS HAVE NOT MATERIALIZED YET: Plans for 70 Japanese drag-net fishermen to go to Mexico initially, with a possible increase in numbers up to 3,600 in the future, were reported in Commercial Fisheries Review, August 1956, p. 66.

The Sub-Director of the Mexican Department of Fisheries has informed the United States Embassy in Mexico that for the last year or so a Mexican company has been negotiating with Japan for the purchase of five fishing boats and for the entry of a limited number of expert Japanese fishermen to instruct Mexicans in the intricacies of drag-net fishing, points out a July 10 report from the Embassy. However, the Embassy representative was reminded that Mexico's labor laws are very strict and that in no case would 3,600 Japanese fishermen be permitted to enter Mexico.

The Mexican Department of Immigration has specified the conditions for the entry into Mexico of a small number of Japanese fishermen, but the Mexican company involved in this transaction has not complied with these requirements, according to the Sub-Director. He declared that every so often the company presents a new variation in the proposal to introduce Japanese fishing boats and fishermen into Mexico but that at the moment the plan appears to be dead.

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WEST COAST SHRIMP SEASON OFF TO GOOD START: The Mexican West Coast shrimp season opened on a note of high optimism. After a closed season that lasted three months, the first shrimp boats put out to sea in May 1956 and returned with glowing reports of the quantity and size of the catch this season. If the season holds up to present anticipations, the shrimp fishery should finish a year every bit as favorable as last year's. "One more good year and all outstanding debts will be paid off," is the thought on every shrimp operator's mind at the time of this report, points out a July 3 United States consular dispatch from Nogales.

New Caledonia

TUNA RESOURCES BEING STUDIED: A special study of tuna in the waters around New Caledonia is being made by the fishing section of the Institute Francais of Oceanic. Attention is being given to the possibilities of tuna fishing as a commercial enterprise, states the Pacific Island Monthly of June 1956.

The scientific fishery vessel Orsom III of the Institute is busily at work in New Hebrides, with two scientists aboard. The men are studying ocean currents, species of fish, and plankton.

For the next international research campaign (which was scheduled betweeen August 10 and the end of September), the Orsom III was allotted the area including the New Hebrides and Fiji, and extending to the Marshalls.

New Zealand

CANNED SARDINE MARKET: Since there is no production of sardines in New Zealand, imports are the only source of canned sardines. New Zealand's imports of canned sardines amounted to 1.0 million pounds valued at NZ£166,200 (US$460,400) in 1955 as compared with 636,000 pounds valued at NZ£107,500 (US$298,100) in 1954. It is apparent that the consumption of canned sardines in New Zealand has increased during the last two years after a decline from the 1950 level of 2.1 million pounds. This increase may be attributed in part to the relaxation of import controls on canned salmon and other canned fish in 1954. The bulk of the canned sardines was imported from Norway and Canada (see table 1), according to the United States Embassy at Wellington (August 10, 1956).

Table 1 - New Zealand's Imports of Canned Sardines by Country of Origin, First Quarter 1956, and Years 1950, 1954, and 1955

Country of Origin	First Quarter 1956			1955			1954			1950		
	Quantity	Value		Quantity	Value		Quantity	Value		Quantity	Value	
	1,000 Lbs.	NZ£1,000	US$1,000	1,000 Lbs.	NZ£1,000	US$1,000	1,000 Lbs.	NZ£1,000	US$1,000	1,000 Lbs	NZ£1,000	US$1,000
United Kingdom	9.6	1.7	4.8	37.6	6.2	17.3	30.5	4.9	13.6	128.3	21.0	58.3
South Africa	-	-	-	-	-	-	-	-	-	0.6	1/	0.1
Gibralter	-	-	-	0.1	1/	0.1	-	-	-	-	-	-
Canada	89.5	8.5	23.5	323.8	35.0	96.9	45.4	5.0	13.9	0.1	1/	0.1
Denmark	1.1	0.1	0.3	3.5	0.5	1.5	-	-	-	14.7	2.4	6.7
Eire	-	-	-	-	-	-	-	-	-	10.6	1.7	4.7
France	-	-	-	0.6	0.2	0.4	-	-	-	-	-	-
Germany, Western	37.9	3.9	10.7	12.9	1.3	3.7	-	-	-	-	-	-
Netherlands	0.7	0.1	0.3	1.3	0.3	0.7	-	-	-	-	-	-
Norway	96.5	18.8	52.0	622.3	131.0	335.2	549.9	96.0	266.0	1,899.8	306.1	847.8
Portugal	-	-	-	11.0	1.3	3.7	0.4	1/	0.1	-	-	-
Sweden	-	-	-	-	-	-	9.9	1.6	4.5	0.8	0.1	0.2
China	-	-	-	-	-	-	-	-	-	1/	1/	1/
Morocco, French	-	-	-	-	-	-	-	-	-	1.5	0.3	0.8
United States	2.7	0.2	0.5	2.2	0.4	0.9	-	-	-	-	-	-
Total	238.2	33.3	92.1	1,015.3	166.2	460.4	636.1	107.5	298.1	2,056.4	331.6	918.7

1/ Less than 50.

The most popular size of imported canned sardines is the $3\frac{1}{4}$ oz. to $3\frac{3}{4}$ oz. flat, although there is quite a large demand for the $1\frac{1}{2}$-oz. size. The 8-oz. rectangular size is also available in small quantities and this is imported from California. There is little demand for the larger sizes.

Table 2 - New Zealand's Retail Prices for Canned Sardines

Size	Type	Price Per Can	
		NZ Shillings/Pence	U.S. Cents
$3\frac{1}{4}$-oz.	Sardine oil	9d	10.5
$3\frac{3}{4}$-oz.	Olive, soya, or sardine oil	1s.2d.-1s.10d.	16.0-25.5
$1\frac{1}{2}$-oz.	Olive or sardine oil	8.5d.-9d.	10.0-10.5
8-oz. rectangular	Natural or sardine oil	2s.10d.	39.5

The most popular packing media are in order of preference: olive oil, natural sardine oil, and soya oil.

Table 3 - Comparative New Zealand Import Tariffs on Canned Sardines, Canned Spiny Lobsters, Herring, Oysters, Pilchard, and Salmon from Various Sources

Item	Canadian	British Preferential	Most Favored Nations	General
Per lb.	$1\frac{1}{2}$d. (10.5 U.S. cents)	$1\frac{1}{2}$d. (10.5 U.S. cents)	$2\frac{1}{2}$d. (18.5 U.S. cents)	3d. (21 U.S. cents) 1/

1/ Plus a surtax of nine-fortieths of the duties otherwise payable.

While there does not appear to be any marked variation in consumption by various income groups, it is probable that the middle income group consumes a relatively higher proportion of sardines. It should be noted that New Zealand is chiefly a country of western culture and relatively high living standards.

The retail market price for $3\frac{1}{4}$-oz. canned sardines packed in sardine oil is 10.5 U.S. cents a can (see table 2).

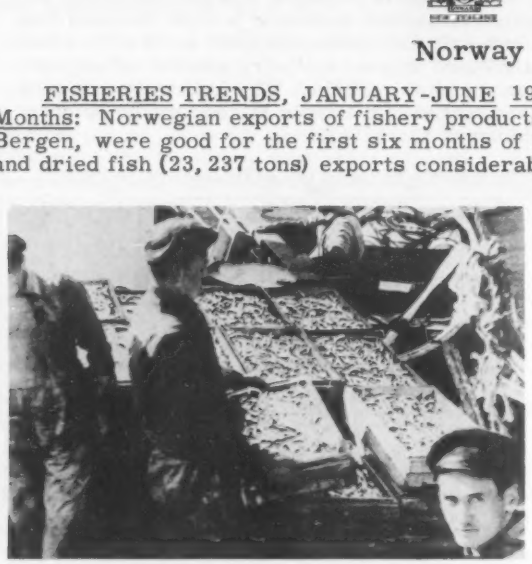
It should be noted that all types of canned fish, including sardines, pilchards, sprats, salmon, etc. were freed from import licensing control from all sources,

including the dollar area, in 1954. Therefore, New Zealand is a market which could be developed by the United States sardine industry.

Note: Values converted to US$ equivalents at the rate of NZ£1 equals US$2.77 and 6d. equal 7 U.S. cents.

Norway

FISHERIES TRENDS, JANUARY-JUNE 1956: Fisheries End Profitable Six Months: Norwegian exports of fishery products, according to early reports from Bergen, were good for the first six months of 1956. Klippfish (29,286 metric tons) and dried fish (23,237 tons) exports considerably exceeded those for the comparable period last year. Fresh and frozen fish exports were slightly lower as was herring meal. Exports of canned fish showed an increase despite the poor brisling catch (one of the worst in decades). The price for canned brisling was US$22 a case as compared to US$16 last year.



Norwegian fishermen loading fish for market.

Favorable Outlook for Fat Herring Catch: Large-scale fishing for fat herring is now going on in the open ocean for the first time, points out a United States Embassy dispatch from Oslo (August 10). In recent years fat herring have not been found in their earlier haunts. Modern purse-seine vessels are being used. By the end of June, 565,000 hectoliters (52,545 metric tons) had already been caught, compared to 168,000 hectoliters (15,624 tons) at that time last year. The fishing takes place principally off Nord Trøndelag.

Fish Grading Rules to Be Altered: Changes and additions to fish-grading laws are being prepared. The Minister of Fisheries has announced that proposals to modify the grading legislation will be made to the Storting. The announcement followed considerable press discussion of complaints in export markets of poor quality Norwegian fish, sparked by a recent Italian rejection of one consignment of salted fish. Some of the press comment admitted some of the complaints were probably justified, and stated it was high time for more rigorous checking on quality. Others, calling attention to increased competition in customary Norwegian markets, stated that buyers are becoming more insistent on superior quality.

Frozen Fish Export Monopoly Temporarily Broken: Findus has obtained a license to export 500,000 pounds of frozen fish-fillet blocks to the United States. This freezing plant is the only one not a member of Norsk Frossenfisk A/L (Frionor), a joint sales agency which has the export monopoly conferred by the Government on sales of frozen fish to all countries except Sweden. Findus has long endeavored to enter the United States market in competition with Frionor. The granting of an export license to Findus was recommended by the export committee for frozen fish, the key body, to the Ministry of Fisheries which recommended the same to the Ministry of Commerce. The permit to export was granted on a trial basis. About 100,000 pounds will be shipped each month until the quota is exhausted, all to the west coast of the United States for use in making fish sticks.

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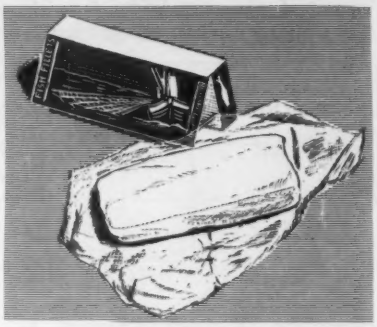
FROZEN FISH EXPORTS: Norwegian Frozen Fish (an export selling organization for most of the Norwegian fillet-packing firms), whose products are sold in the United States under one brand, exported a total of 22,000 metric tons of frozen fish fillets in the last 12 months, reports the Norwegian Information Service in the September 1956 News of Norway. Representing a 10-percent increase as compared with the previous 12-month period, the exports are equivalent to about 50,000 tons of raw fish, or nearly a normal Lofoten fishery catch. Besides the United States, these frozen fish products are now sold in 20 foreign countries, including Cyprus, Belgian Congo, South Africa, and Australia. New markets are being added, despite sharper competition and other difficulties.



One-pound package of Norwegian frozen fish fillets.

Another Norwegian packing firm, which has good sales to Sweden and Denmark, recently entered the United States market with a shipment of 25 tons of frozen fish fillets.

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WORLD'S LONGEST SALMON LADDER: In the Rana River, North Norway, the world's longest salmon ladder is nearing completion. Main feature of the ladder is a tunnel about 500 yards long blasted out of rock. Up to now the salmon have only ascended about 5 miles up the river. The tunnel will enable them to travel many miles further upstream, and greatly increase the stock of fish in the river. Total cost of the scheme is £18,000 (US$50,000), which the sponsors believe will be covered by the income from the increased salmon yield next year, states World Fishing of July 1956.

Peru

FISHERIES TRENDS, AUGUST 1956: The marketing outlook for Peruvian fishery products as of August 1956 was somewhat mixed. Although the British market, which is now taking approximately half of the output of Peruvian canneries, is fully booked at good prices for the forthcoming season, the United States market for Peruvian canned fish is somewhat in doubt.

The fish meal market was good in the first half of 1956, but prices are now weak and exports for the second half of 1956 probably will drop, an August 21 dispatch from the United States Embassy at Lima announces.

Republic of the Philippines

CANNED SARDINE MARKET: Imports of canned sardines in the Philippines indicate a steady increase in consumption since 1953, according to a dispatch (July 6) from the United States Embassy at Manila. There is no domestic sardine industry.

Philippine imports of anchovies, herring, and sardines (pilchards) amounted to 83.6 million pounds (valued at US$10.4 million) as compared with 39.6 million pounds (valued at US$5.2 million) in 1954. The United States is a leading supplier. Trade sources state that United States sardines are preferred and that consumption

Table 1 - Philippine Imports of Canned Sardines and Similar Fish, 1953-55

Type of Fish and Country of Origin	1955			1954			1953		
	Quantity	Value		Quantity	Value		Quantity	Value	
	Metric Tons	₱1,000	US$1,000	Metric Tons	₱1,000	US$1,000	Metric Tons	₱1,000	US$1,000
Anchovies:	8,047	4,691	2,346	7,891	5,112	2,556	15,389	11,623	5,812
United States	7,678	4,495	2,248	7,877	5,103	2,552	15,389	11,623	5,812
Other	369	196	98	14	9	4	-	-	-
Herring:	25	25	12	29	21	10	39	23	12
United States	-	-	-	1	2	1	27	15	8
Hong Kong	21	21	10	22	14	7	-	-	-
Other	4	4	2	6	5	2	12	8	4
Sardines (Pilchards):	29,912	16,107	8,054	10,072	5,345	2,673	7,465	4,175	2,087
United States	18,547	10,427	5,214	1,539	985	493	2,339	1,457	728
British Africa	5,327	2,342	1,171	5,045	2,375	1,187	2,452	1,240	620
Japan	4,777	2,375	1,187	3,049	1,505	752	90	46	23
Netherlands	8	4	2	-	-	-	2,157	1,025	512
Other	1,253	959	480	439	480	240	427	407	204
Grand Total	37,984	20,823	10,412	17,992	10,478	5,239	22,893	15,821	7,911

declined in 1953 and 1954 only because California shippers were unable to supply the demand because of an unexplained drop in the California sardine catch.

The most popular sizes of canned sardines purchased by 90 percent of the consumers are the 1-lb. ovals (35 percent); 5-oz. tall (30 percent); and 1-lb. tall (25 percent). Some $3\frac{1}{4}$-5 oz. flats 8-oz. talls, and 8-oz. rectangulars are also sold.

Table 2 - Philippine Retail Prices for Canned Sardines

Type	Size of Can	Price Per Can	
		₱	U.S. Cents
Olive oil	$3\frac{1}{4}$-5-oz. flag	0.60	30.0
Tomato sauce	$3\frac{1}{2}$-5-oz.	0.25	12.5
" "	8-oz. tall & 8-oz. rectangular	0.30	15.0
" "	1-lb. talls	0.45	22.5
" "	1-lb. ovals	0.50	25.0
Natural	1-lb. talls	0.40	20.0

Seventy percent of the consumers prefer sardines packed in tomato sauce, 25 percent natural pack, and 5 percent olive-oil pack.

About 90 percent of the canned sardines are eaten by persons of the low income group and 10 percent by the middle income group.

The retail market price of the 1-lb. oval can of sardines packed in tomato sauce is 25 U. S. cents a can (see table 2).

Normal channels of distribution are through importers who either act as wholesalers or sell to wholesalers, who in turn sell to retailers. Sardines are "decontrolled" in the Philippine Central Bank's Statistical Classification of Commodities for import, meaning that dollars are freely granted for their importation.

Portugal

NUMBER OF NEW FISHING VESSELS TO OPERATE AT EACH FISHING PORT TO BE REGULATED: Because many applications have been filed for permission to construct vessels for local and offshore fishing, the Navy Ministry by Decree 40,728 of August 18, 1956, extended authority to regulate the number and type of new fishing vessels which may be operated at each fishing port. One purpose was to avoid possible overfishing, states a United States Embassy dispatch (August 23, 1956) from Lisbon.

The text of the new decree reads in translation:

"Article 1. The granting of licenses for carrying out local fishing activities with motorized vessels and offshore fishing with vessels using any system of propulsion may be regulated by Ministerial Order for vessels having a module of less than 60, upon registration filed in the names of the fishermen.

"Sole Paragraph. The provisions of this article do not apply to vessels already registered on the date of entrance into force of this decree.

"Article 2. Upon hearing the interested parties, the Ministry of the Navy may establish by ministerial order limitations, with respect to each fishing port, as to the number and type of fishing vessels, both local and offshore, which may discharge their catch at such ports."

The decree confirms reports of considerable activity in constructing small fishing vessels, chiefly motorized wooden vessels of sizes ranging up to 15 tons.

Launching of one of the new trawlers constructed in Portugal.

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FISHERIES TRENDS, MAY 1956: Sardine Fishing: Sardine catches in Portugal during May once again were highly unfavorable. Of the 825 metric tons (valued at US$191,000 ex-vessel) of sardines landed at the packing centers during the month, only 34 tons (valued at US$8,000) were purchased by the canneries. The balance was absorbed for immediate consumption because of the shortage of other foodstuffs. In comparison, the sardine landings in May 1955 amounted to 5,398 tons (valued at US$532,000). The principal sardine ports in May 1956 were V. R. Sto. Antonio, Lisbon, Matosinhos, and Setubal.

Other Fishing: Landings of fish other than sardines totaled 2,623 metric tons (valued at US$445,000 ex-vessel) and consisted principally of anchovy and chinchard and a few tons of tuna, bonito, and mackerel, the July 1956 Conservas de Peixe reports.

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CANNED FISH PACK, JANUARY-MARCH 1956: The Portuguese canned fish pack in March 1956 was very light and consisted of principally sardinelike fish. The canned fish pack for January-March amounted to 75,100 cases, the July 1956 Conservas de Peixe points out.

Canned Fish Pack, January-March, 1956

Product	Net Weight	Canner's Value
	Metric Tons	1,000 US$
In Olive Oil:		
Sardines	532	324
Sardinelike fish	802	811
Tuna	38	40
Other species (incl. shellfish)	21	15
In Brine:		
Sardinelike fish	8	3
Other species	28	6
Total	1,429	1,199

Note: Values converted to US$ equivalent on basis of 28.75 escudos equal US$1.

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CANNED FISH EXPORTS, JANUARY-MAY 1956: Total Portuguese canned fish exports in May 1956 totaled only 2,932 tons (154,000 cases), valued at US$1.7 million, as compared with 4,228 tons, valued at US$2.1 million, for the same month in 1955.

Portuguese Canned Fish Exports, January-May 1956

Species	January-May 1956	
	Metric Tons	1,000 US$
Sardines in olive oil	12,150	6,352
Sardinelike fish in olive oil	1,891	1,636
Sardines & sardinelike fish in brine	561	108
Tuna & tunalike in olive oil	387	315
Tuna & tunalike in brine	96	53
Mackerel in olive oil	563	345
Other fish	214	100
Total	15,862	8,909

For the first five months of 1956, canned fish exports amounted to 15,862 tons (834,800 cases), valued at US$8.9 million, as compared with 22,811 tons, valued at US$11.0 million, for the same period in 1955. Sardines in olive oil was the leading product exported.

In May 1956 France was the principal buyer of Portuguese canned fish, followed by Germany, the United Kingdom, and the United States.

For January-May 1956, the leading canned fish buyer was Germany with 2,747 tons (valued at US$1.4 million), followed by the United Kingdom with 1,768 tons (valued at US$0.9 million), and the United States with 1,754 tons (valued at US$1.4 million). Exports to the United States consisted of 710 tons of sardines, 910 tons of anchovies, and 8 tons of tuna.

Spain

FISHERIES TRENDS, JULY 1956: The Spanish fishing industry was very active in July 1956 due principally to heavy catches of albacore tuna landed at Vigo. Other ports in Galicia also reported good catches of albacore. The fish canneries have been operating at a high level, packing albacore for export markets, states a United States Consular dispatch from Vigo (August 8, 1956).

Fishing: The increase in landings at Vigo in July was the result of heavy catches of albacore tuna (Germo alalunga) which is known locally as "bonito." Although the albacore season started late, results have been excellent to date and have partly compensated the canneries for the lack of sardines. The average daily landings of albacore at Vigo amounted to around 330,000 pounds during the first two weeks of July. Deliveries were lower during the latter part of the month but it was anticipated that catches of commercial importance would continue for some time. La Coruna is another important fishing port and it also received heavy catches of albacore. It is reported that fishing boats from other districts of Northern Spain have unloaded their catches of albacore at Vigo and at La Coruna because higher prices were paid. Albacore brought an ex-vessel price of around US$0.15 a pound, but the price has been as high as US$0.17 a pound.

Fish Canning: The fish canneries in the Vigo area purchased 4.9 million pounds of fish at the local fish exchange in July 1956, as compared with only 98,000 pounds for the previous month and 1.7 million pounds in July 1955. The greater part of the July 1956 purchases consisted of albacore which was very abundant.

The tin-plate situation is reported unsatisfactory for the canneries. However, in view of the abundant supply of albacore at high prices, it is expected that there will be an improvement in the tin-plate situation for the canneries. It is quite pos-

sible that the canneries are now using the last of their reserve stocks of tin plate in order to take advantage of the heavy catches of albacore.

Note: Value converted at the rate of 1 peseta equals US$0.0256.

Switzerland

CANNED SARDINE MARKET: Since there is no domestic production of canned sardines in Switzerland, imports are the only source of canned sardines. Sardine imports are not shown separately in Swiss import statistics but lumped together with other canned fish and, consequently, domestic consumption can be estimated only roughly.

The bulk of imports of canned fish from Portugal probably consists of sardines, while France exports to Switzerland both sardines, tuna, mackerel, and some other fish. Imports from Spain consist of sardines and tuna, but the share of tuna is larger.

By using the source of imports as a basis of calculation, it may be estimated that total imports of sardines in 1955 amounted approximately to 1,900 metric tons as compared with 1,600 tons in 1954, points out a United States Embassy dispatch (June 25, 1956) from Bern.

Sardine consumption is stable. There is no definite trend in the sense of a change in preferences for certain brands, can sizes, etc. About 80 percent of the sardines consumed in Switzerland are with bones and skin, some 12 percent are boneless sardines with skin, and the remaining 8 percent are skinless and boneless sardines.

Seventy percent of the canned sardine imports are packed in 125-gram (4.4-oz.) cans, the height of the can being 30 millimeters; 12 percent in 105-gram ($3\frac{3}{4}$-oz.) cans, 22 millimeters high; 8 percent in 150-gram (5.3-oz.) cans, 30 millimeters high; 5 percent in 325-gram (11.5-oz.) cans, 40 millimeters high (locally called "American Club"); and 5 percent in 780-gram, (27.5-oz.) cans, 80 millimeters high and in 56-gram (2-oz.) cans, 20 millimeters high. The larger cans are normally purchased by hotels and restaurants.

All these cans are rectangular, with rounded corners. Only pilchards, mackerel, and other fish are marketed in oval cans, while salmon and tuna are often in tall round cans. Sardines are usually imported in 100-can cases. Some retailers would prefer to have sardines in 50-can cartons, which are easier to handle.

About 90 percent of all sardines consumed in Switzerland are packed in olive oil. Sardines in cottonseed or peanut oil, natural sardines, or sardines in brine, tomato, or mustard sauce are not popular in Switzerland.

Table 1 - Switzerland's Retail Prices for Canned Sardines

Size of Can		Price Per Can	
Grams	Ounces	Swiss Francs	U. S. Cents
780	27.5	3.50-4.20	81.8-98.1
325	11.5	1.90-2.20	44.4-51.4
150	5.3	1.10-1.30	25.7-30.4
125	4.4	0.65-0.95	15.2-22.2
105	3.7	0.85-1.00	20.0-23.4
56	2.0	0.45-0.65	10.5-15.2

All income groups consume sardines. Middle and high income groups consume the more expensive, often French, brands, chiefly boneless and skinless in olive oil, salt added, while low income groups consume cheaper brands, often Portugese, with skin and bones. Sardines are consumed as snacks or hors d'oeuvres and eaten during hikes and mountain-climbing tours. Sardines can be found in remote village stores and competition is keen, since retailers have a liberal supply of canned fish on the shelves.

The retail market prices for sardines packed in the 4.4-oz. can range from 15-22 U.S. cents a can and from 20-23 cents for the $3\frac{3}{4}$-oz. can (see table 1).

The price difference between boneless and skinless sardines and other sardines is illustrated in showing the retail prices for the different types packed in the popular 4.4-oz. can:

Type of Canned Sardines	Price Per Can	
	Swiss Francs	U. S. Cents
With bones and skin in olive oil	0.65-0.95	15.2-22.2
Boneless but with skin in olive oil . . .	0.85-1.00	20.0-23.4
Boneless and skinless in olive oil . . .	1.10-1.30	25.7-30.4

Sardines in $3\frac{3}{4}$-oz. cans and those in smaller cans are usually fish of superior quality, boneless and skinless, in good olive oil, salt added. Some Portugese sardines have names of United States distributors on the can, but are imported directly from Portugal. French sardines of well known makes are more expensive but their sales, despite the general prosperity prevailing in Switzerland, are limited. Sardines packed in peanut oil are normally retailed at prices slightly lower than those in olive oil.

Imports are largely conditioned by prices. There is no customs or other discrimination against United States canned fish, but United States sardines are practically unknown on the Swiss market, while other canned fish, lobsters, etc. are known and appreciated. If American sardine exporters are able to offer their products at competing prices, there is no reason why their efforts should not be successful. At present Portugese sardines happen to be cheap, while French sardines are reported to be too expensive. As a result more orders are placed now in Portugal, but the situation may change if France, or any other country, lowers its prices.

Sardines are purchased by importers and, more rarely, by wholesalers. It is rare that cooperatives or retail chain-store organizations import themselves.

Note: Values converted to US$ equivalents at the rate of 1 Swiss franc equals 23,364 U. S. cents.

Union of South Africa

CANNED SARDINE MARKET: The production of canned sardines (pilchard) in the Union of South Africa and South-West Africa varies slightly over the years, according to a July 27 dispatch from the United States Embassy at Cape Town. In 1955, 1.6 million actual cases of canned pilchard were produced, which is a fairly good average of their annual pack. The plants in 1955 used 383,131 short tons of raw fish to produce this pack.

The pack of canned sardines is restricted by a catch quota system imposed by the Union Government as follows:

South-West Africa - 250,000 short tons of raw pilchards
Union of South Africa - 250,000 short tons of raw fish, including pilchards and maasbankers but excluding true mackerel.

The consumption of locally-produced canned sardines is best analyzed by the 1955 local market sales which totaled 366,033 cases of all sizes and packs. In general, the local trend shows that consumption is on the increase. This can be noted by substantial increases in the sales of canned pilchards over the past four years, possibly in view of lower prices and more active marketing on the part of sellers.

The most popular sizes of canned sardines are: 1-lb. tall which accounts for 47.3 percent of the sales; 8-oz. tall, 26.2 percent; 1-lb. ovals, 9.3 percent; 8-oz. flat, 10.1 percent; 5-oz. tall, 5.5 percent; and 14-oz. flat round, 1.6 percent. About 72.5 percent of the sardines consumed are packed in tomato sauce, and 27.5 percent in brine.

The current retail market price for 1-lb. tall cans of sardines packed in tomato sauce range from 18-21 U.S. cents and in brine from 15-18 cents (see table 1).

Table 1 - Union of South Africa Retail Prices for Canned Sardines

Size	Price Per Can			
	Tomato Pack		Brine Pack	
	In Shillings & Pence	U.S. Cents	In Shillings & Pence	U.S. Cents
3¼ to 5 oz. flat	7d. - 9d	8-11	6d.	7- 9
8-oz. tall . . .	9d. -10d.	11-12	8d. -9d.	9-11
1-lb. tall . . .	1s. 3d. -1s. 6d.	18-21	1s. 1d. -1s. 3d.	15-18
1-lb. oval . . .	1s. 9d. -2s	25-28	-	-

The limited quantities of sardines imported can be traced almost entirely to Norway and Portugal. Strict import controls and lack of hard currency allocations for nonessential foodstuffs are mainly responsible for the virtual absence of United States sardines on the local market.

Note: Values converted to US$ equivalents at the rate of £1 equals US$2.80.

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CONTROLLED FISH MEAL PRICE INCREASED: The Union of South Africa's fish meal industry as of April 12 has been granted an increase in the controlled selling price of its product on the South African market. The price was raised from £30 (US$84) a short ton to £38 (US$106.40). This was the first price increase authorized for fish meal since the inshore fishing industry started to produce it on the West Coast 10 years ago. As expected, this increase has passed along the line from the feeds producer to the farmer. On overseas markets today the same short ton of fish meal would earn about £54 (US$151) a ton. Subtract shipping costs of say £7 (US$20) and export meal still earns more than the meal which has to be sold on the local market.

Instead of retaining the full increase, the fishing industry has been told that part of it must be passed on to the Cape West Coast fishermen in the form of a higher price for fish. The industry will have to pay at least 2s. or 3s. more for raw fish so that the £8 (US$22.40)-a-ton increase allowed on meal is really only about £5½ to £6½ (US$15.40-18.20), points out The South African Shipping News and Fishing Industry Review of May 1956.

Note: (1) See Commercial Fisheries Review, May 1956, p. 61. (2) Values converted on basis of SA£1 equals US$2.80.

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FISHERIES TRENDS, JULY 1956: Fishing in Union of South Africa waters, which was disappointing in June, improved considerably in July. However, not all of the catch was suitable for canning and the output of canned fish in July was less than expected.

Large quantities of fish meal and fish oil reportedly were produced by the South African fishing industry in July, states an August 7, 1956, dispatch from the United States Consulate at Cape Town.

The market for South African canned fish was strong during June and July, while demand for fish meal and fish oil was seasonally low.

Production of canned and frozen spiny lobster continued to be constant and satisfactory in view of continued excellent demand and steady prices in overseas markets.

Union of South Africa - South-West Africa

FISHING AND PROCESSING LEVY TO FINANCE PILCHARD RESEARCH: Union of South Africa and South-West Africa fishermen are taxed 2d. (2.3 U.S. cents) a metric ton and factories 4d. (4.7 U.S. cents) a ton for each ton of pilchards caught and processed, respectively, to help pay for research on this fishery. The purpose of the tax was recently explained by a member of the South-West Legislative Assembly at a large meeting of fishermen in Walvis Bay in April 1956.

It was pointed out that the vital pilchard research program is being carried out by the combined fisheries research teams of the South-West Administration and the Union of South Africa's Division of Fisheries.

The Union Government already spent US$700,000 on this research and the South-West Administration US$238,000. However, more intensive efforts were considered necessary and to cover the extra cost of three new research vessels and 16 additional scientists in the Union and South-West Africa another US$431,000 would have to be spent of which the Union would contribute US$347,000 and South-West Africa US$84,000.

The meeting was unanimous in its decision to support the tax and agreed that the factories should subtract the fishermen's tax monthly from the payments to the fishermen and then hand the money over to the Administration, states The South African Shipping News and Fishing Industry Review of May 1956.

U.S.S.R.

LARGER FISHING FLEET OPERATING NEAR FAROE ISLANDS: The Soviet Russian fleet engaged in fishing operations near the Faroe Islands has usually numbered about 125 trawlers and about 10 mother vessels but recently, it is reported, the number of trawlers has been increased to about 300. The Soviet Minister for Fisheries has stated to Norwegian newspapers that further expansion of the fleet is contemplated; a part of the 50 ultramodern trawlers which the U.S.S.R. has under construction in German shipyards will be commissioned in that trade in 1958.

Local Faroese newspapers state that the Danish authorities have recently loosened their very restrictive attitude towards admitting Russian vessels and their crews to the Islands. In general, the vessels were allowed to call at the ports only for water and in medical emergencies; the crews were not permitted to go ashore, and the vessels were under constant police surveillance. Now, it is stated, the Russians generally enjoy equal rights with the vessels and crews of other nations.

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REPORT ON FISHERY RESEARCH BY NORWEGIAN SCIENTIST: Norwegian scientist Finn Devold, who is well known for his research work on herring, served recently as a member of a Norwegian fishery delegation to the Soviet Union. His observations, as reported in the July 18, 1956, Fiskaren (Norwegian trade periodical) upon his return indicated that Russian fishery research is extensive and suc-

cessful. Devold visited the Oceanographic Research Institute in Moscow which functions as the central point for similar institutes in Vladivostok on the Pacific Ocean, Astrakan on the Caspian Sea, Suchumi on the Black Sea, Rostov on the Sea of Asov, Leningrad on the Gulf of Finland, and Murmansk on the Barents Sea. He also visited the institutes on the Black Sea, the Caspian Sea, and at Murmansk. He classed the latter as one of the world's great fish harbors.

The Murmansk institute directs cod and herring research in the Barents Sea and the Norwegian Sea. It supervises three oceanic research vessels. One vessel spends the whole year on research in the Barents Sea while the other two are occupied with herring research in the Norwegian Sea. These vessels operate in much the same manner as the Norwegian research vessels and with the same objectives. The Russians are, therefore, very much interested in cooperative work with the Norwegians.

The Murmansk institute was built in 1954 and is very modern. In some respects the research vessels are better equipped than their Norwegian counterparts. For example, they were equipped with underwater television and a bathysphere. The latter could be sunk to a depth of several hundred meters with a man inside. He could observe with his own eyes how fish acted at that depth, how trawl gear operated, etc. The vessels also had Asdic and echo-sounders but in this respect the Norwegian research vessel G. O. Sars was much better equipped.

Both the Russian and the Norwegian fishery ministers were interested in developing cooperative or coordinated research studies.

With regard to the biology of the huge herring resources, the Norwegian and the Russian experiences and knowledge were in good agreement. Of particular interest was the fact that the Russians had an indication of the strength of a year-class much earlier than the Norwegians. Because of their Barents Sea observations they could state that 1953 was a relatively good year-class while 1952, 1954, and 1955 were poor. The Norwegians have not been able to gauge the strength of a year-class until it comes in as young spawning herring at four or five years of age.

The Russians were especially interested in confining utilization of the cod and herring to the level the resources could stand. Joint control of these species is of interest to both countries but the problem is not a simple one because the economic side is important. The Russians are interested primarily in the large herring and would prefer to see the Norwegian small herring fishery curtailed. The Norwegian fishermen have a good income from this fishery and are primarily interested in having the small cod spared as much as possible. They would like to see the Russians curtail their cod fishery in the Barents Sea, especially for the younger year-classes of cod.

United Kingdom

COMMERCIAL TEST FOR AUREOMYCIN-STORED FISH: Great interest was shown in 14,000 pounds of aureomycin-stored fish, part of the catch of the Hull trawler Loch Moidart, when she arrived at that port on July 10 after a 17-day trip to the Iceland fishing grounds.

The fish was 14 days old and the verdict concerning it was just as favorable as when similarly-preserved fish from a research vessel had been shown recently alongside normally-stored fish of a similar age.

The 14-day old fish was older than the Hull average, but the purpose of the experiment was to give members of the fishing industry an indication of whether or not they could expect a reduction in the spoilage rate of older fish. Both treated and untreated fillets were available for inspection, the aureomycin-preserved fish forming part of the first big-scale commercial test, states The Fishing News (July 13), a British periodical.

Later the aureomycin-stored fish were taken by the Humber Laboratory which will send some to the Torry Research Station for further tests.

None was sold for human consumption as the British Foods and Drugs Act will not permit it yet.

In mid-June another trip of aureomycin-stored fish had been brought to Hull from the Faroese fishing grounds by the Diesel-electric research trawler Sir William Hardy and the demonstration immediately followed a similar one at Grimsby for display. Visitors subjected the fish to the closest possible scrutiny and they had an opportunity of comparing that stored in aureomycin ice with that caught at a similar time but stored in ordinary ice.

The fish on view had been stored for periods varying from 16 to 27 days and one could not help notice how relatively fresh and odorless was that which had been preserved by antibotics, points out the June 22 issue of The Fishing News.

Trade reaction was favorable. Praise came not only from the Hull fishing industry but also from Fleetwood trawler owners.

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FISHING INDUSTRY SUBSIDIES AND GRANTS CHANGED: Several schemes affecting fishing subsidies and grants were laid before Parliament by the Minister of Agriculture, Fisheries and Food and the Secretary of State for Scotland and passed.

"The White Fish Subsidy (United Kingdom) Scheme, 1956" changes the rates and conditions of payment of the whitefish subsidy, and will be in effect for 12 months from August 1 this year.

For vessels between 70 and 140 feet in length, and for seine-net vessels of any size which normally make voyages of more than 7 days, the Scheme provides for a fixed payment, varying according to the size of vessel, for each day spent at sea (including the day on which the catch is sold) up to a maximum of 300 days in the year. This replaces the present two-part subsidy comprising a flat-rate payment of 2d. per stone (16.7 U.S. cents a hundred pounds) of fish landed plus a voyage subsidy with over-riding maximum based on the length of the voyage and the proceeds of the catch.

For vessels of 70 feet in length and under, the present flat-rate subsidy of 8d. a stone (66.7 U.S. cents a hundred pounds) of fish landed, 6d. (50 U.S. cents a hundred pounds) on ungutted fish, and the conditions of payment remain unchanged.

The new rates mean increased subsidies for most near- and middle-water vessels to meet higher costs of operation. The Scheme provides that only those officers and crews whose remuneration is settled on the net earnings of the vessel, and who are therefore affected by increases in operating costs, will receive a share of the increase in the subsidy. All officers and crews, however remunerated, will continue to share in subsidies up to current levels of payment.

"The White Fish Subsidy (Aggregate Amount of Grants) Order, 1956," raises from £7.5 million to £10 million (US$21 million to US$28 million) the aggregate

amount of subsidy that may be paid under the provisions of the "White Fish and Herring Industries Act, 1953." This Order was also approved in July.

"The White Fish Industry (Grants for Fishing Vessels and Engines) (Amendment) Scheme, 1956," and "The Herring Industry (Grants for Fishing Vessels and Engines) (Amendment) Scheme, 1956," amend the Schemes made in 1955 for the payments of grants by the White Fish Authority and the Herring Industry Board towards the cost of new fishing vessels up to 140 feet in length and of new engines for existing vessels. Approved by both Houses of Parliament in July.

The last two Schemes increase the maximum amount of grant which may be paid in respect of any one vessel. This will have the effect of making available grants equivalent to the same proportion of the price of a new vessel as when grants were first introduced at a time when building costs were lower. For white fish vessels the maximum is raised from £25,000 to £30,000 (US$70,000 to US$84,000); for herring vessels, from £12,000 to £15,000 (US$33,600 to US$42,000). The White Fish Industry Scheme also exempts line-fishing vessels from the condition limiting the number of trips which a grant-aided vessel may make to distant waters. All other conditions in the 1955 Schemes remain unchanged, and the new Schemes will not affect the payment or conditions of grant in respect of any applications already approved under the present Schemes.

The schemes were debated in the House of Commons and in his speech, the Minister pointed out that there were now 50 grant-aided near- and middle-water trawlers in use, and 18 more were due to be completed this year. Another 55 had been grant-approved and would be completed on various dates from next January, reports World Fishing of August 1956.

"The White Fish Authority (General Levy) (Amendment) Regulations Confirmatory Order, 1956," confirms regulations made by the White Fish Authority, increasing as from October 1, 1956, the levy imposed by the "White Fish Authority (General Levy) Regulations, 1952" as amended by the "Amendment Regulations of 1953," from one farthing to one halfpenny for every stone (4.2 U.S. cents a hundred pounds) of white fish landed on first-hand sale.

Note: (1) Values converted to US$ equivalents at the rate of £1 equals US$2.80.
(2) Also see Commercial Fisheries Review, April 1956, p. 41.

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FISH MEAL GROWING IN IMPORTANCE: Approximately half the tonnage of fish brought into the distant-water British ports ends up in the form of white-fish meal, an extremely valuable high-protein feed used chiefly for pigs and poultry, but also for other farm stock. In the case of Hull and Grimsby, the raw material used last year totaled about 220,000 metric tons. About 75 percent of the distant-water catch is filleted and the offal (heads, tails, bones, and a part of the meat) makes up the bulk of the raw material sent to the dockside factories for conversion into fish meal by a modern dehydration process. The remaining tonnage is made up of unsold fish. The fish and the offal are all converted into fish meal within 24 hours of landing.

Total 1955 production at Hull and Grimsby amounted to 52,000 metric tons of white-fish meal, representing about 70 percent of the whole British output, The Fishing News (May 25, 1956) pointed out in an abstract of the report issued by the British Trawlers' Federation.

The farmer pays approximately £70 (US$196) a metric ton for fish meal and he has to use 10 percent fish meal in a standard ration mixture for pigs. It takes 4.3 tons of fish to make one ton of meal. Fish is sold to the fish-meal factories at a price well below the minimum auction price for fresh fish.

Hull and Grimsby fish meal is sold under one brand name and is guaranteed 66 percent protein, less than 4 percent oil, and less than 2 percent salt.

British fish-meal imports are declining with the increase in domestic production.

Manufacturers of white-fish meal at Hull and Grimsby reported that production and sales soared to a record level during the first six months of 1956 when over 26,022 tons were sold to British farmers, compared with 19,469 tons in the same period in 1955. This was an increase of 32.5 percent.

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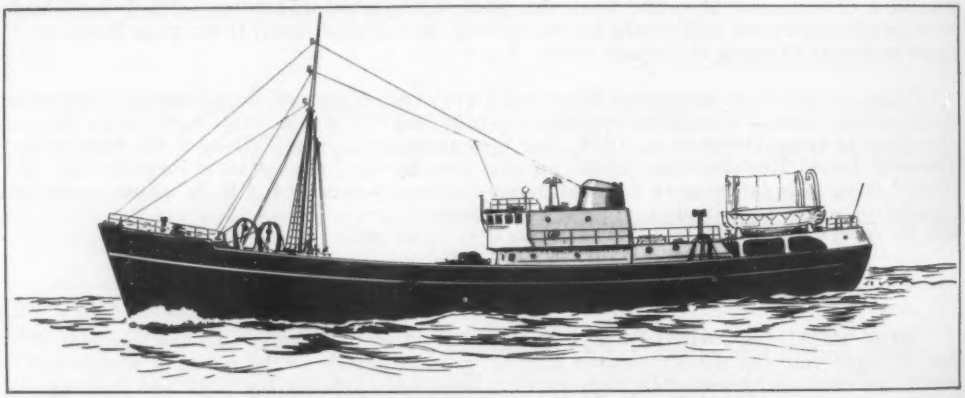
LARGE ALL-WELDED TRAWLER BUILT: The largest all-welded trawler built in the United Kingdom, the Boston Seafoam, was constructed for a British fishing company. She was commissioned in April 1956 and her trials were completed on the Humber River.

Boston Seafoam is probably the fastest ship of her class, states the April 13, 1956, issue of The Fishing News.

The vessel was built upside down. Her deck panels were first laid and the hull built upwards to the keel. Casings and superstructure were also built in this way and the ship contains 12 prefabricated units up to deck level.



The Boston Seafoam, largest all-welded trawler in the United Kingdom.

These sections were turned over ready for welding by a 12-ton electric and 7-ton steam crane and the ship has eight main welded joints.

Principal dimensions are: registered length 139 ft. 6 in., length between perpendiculars 137 ft. 6 in., moulded breadth 28 ft., moulded depth 14 ft.

The efficient hull design was confirmed by tank tests at the National Physical Laboratory, and was built in prefabricated sections according to the requirements of Lloyd's and the Ministry of transport.

A pleasing and attractive appearance has been obtained, and the vessel has a soft-nose stem, cruiser stern, and streamlined superstructure.

The 16-man crew are berthed in one eight-berth cabin and two four-berth cabins situated aft under the quarterdeck.

Three single cabins for the chief engineer, mate, and wireless officer have been placed in the deckhouse along with the messroom, galley, food store, oilskin locker, and officers' toilet.

A deckhouse at the aft end of the main deck has been arranged as a crew's washroom, bathroom, toilet and drying room.

Access to the steering gear compartment and coal bunker is by means of hatches in the deckhouse.

A spacious cabin has been provided for the skipper and this is adjacent to the wireless room. The latest navigational aids, including radar, direction finder, and echo-sounder have been istalled.

Two lifeboats are situated on the boat deck aft, and these are operated by davits port and starboard. Inflatable life rafts will also be provided at Fleetwood, the vessel's home port.

Insulated and wood sheathed, the large capacity fishroom has an area of 9,000 square feet.

An electric trawl winch will carry 1,200 fathoms of warp on each drum and the installation is driven by an electric motor situated in the fore end of the deckhouse.

The winch installation can be controlled from either deck or bridge.

The forecastle is arranged for net stowage, lamp and paint rooms, and other suitable stores are situated below.

Liver tanks are placed on both port and starboard sides below the main deck level forward of the fishroom, and the livers are discharged through drain valves in the ship's sides.

There is a tubular steel foremast on the main deck, and two steel bobbin derricks are attached to the casing, while the anchor is handled by electric windlass.

The Diesel propelling machinery is a direct-reversing engine capable of developing 910 b.h.p. at 260 r.p.m. Fresh-water cooling is incorporated.

Power for the trawl winch generator is provided by a fresh-water cooled Diesel engine developing 315 b.h.p. at 600 r.p.m. The excitor to the generator has an output of 26 kilowatts 220 volts d.c., and has been arranged to supply power to the ship's mains if required.

Additional generating capacity has been provided by a 30-kilowatt 220-volt d.c. generator driven from the intermediate shaft when steaming to and from the fishing grounds.

A further generator of 17-kilowatts output has been included in the auxiliary set along with a clutch-coupled air compressor and general service pump.

Other engineroom equipment includes shaft-driven bilge pump, electrically-driven Diesel oil transfer pump, centrifugal oil purifier, lubricating oil pump, oil pump for the hand hydraulic steering gear and a Diesel-driven air compressor set.

Hot water for domestic and accommodation heating is supplied by an oil-fired boiler.

The main fuel oil bunkers are carried in port and starboard tanks at the fore end of the engineroom. Lubricating oil tanks are arranged in the double bottom, as is the fresh-water tank under the fore end of the fishroom.

In the engineroom the main switchboard is arranged so that any one generator can operate at a time, and an independent lighting system with circuits to the aft accommodation, wheelhouse and engineroom, is operated from a 12-volt 250-amp. battery.

The Boston Seafoam has been fitted with marine radio, radar, and echometer equipment, plus an auxiliary display unit, the "Fishviewer," which enables any 5- or 10-fathoms section of the water below the ship to be examined separately on a cathode-ray tube.

A receiver with remote loudspeakers and three-way talkback arrangement is employed for broadcast entertainment and orders. Talkback facilities are provided from the engineroom and steering flat.

*****

RESEARCH ON HANDLING AND PRESERVING FISH: The Torry Research Station, Britain's principal facility for carrying on research on the improvement of existing ways of handling and preserving fish as a food, is located at Aberdeen, Scotland's major fishing port. This is a summary of the principal projects with which the staff is now concerned:

Bacteriological Studies in Connection with Fish Spoilage: Bacteria have been found always to be present on the skin of fish, but not all species of bacteria cause decay. The scientists are endeavoring to ascertain what kinds of bacteria are responsible for decay and how they can be controlled so that, with proper treatment, fish may be landed in edible condition even though they may have been in the iced holds of fishing vessels for a longer period than they now can be kept without deterioration. One experiment which is being tried is the addition of aureomycin and perhaps other antibiotics to water used in making ice to be carried in trawlers for icing fish, to find out whether this method will beneficially reduce the harmful skin bacteria count and thus retard deterioration.

Another facet of the study concerns inspection of fish offered for sale. At present, it is understood that inspectors must depend almost entirely upon visual inspection to determine whether landed fish are in proper condition for human consumption. Along with their studies of skin bacteria, the Torry scientists are experimenting with chemically-impregnated paper which, when laid on the skin of fish, will change color in degrees related to the presence of the types of skin bacteria the paper is treated to detect. If successful, this method will provide a scientific means of determining the state of fish thus giving better protection to theconsuming public and putting an end to controversy with fishermen whether particular lots of fish may be sold for human consumption or must be condemned for sale as fertilizer.

Quick-Freezing Apparatus Suitable for Installation in Trawlers: This study is related to the fact that even with modern fast trawlers, time necessary to go long distances to grounds where fish are abundant results in the earlier part of the catch being out of water so long as to have passed the peak of quality by the time it is landed. This study is concerned with the feasibility of installing quick-freezing apparatus in trawlers, designed not to handle all the catch but only that portion which would have to be kept on hand too long before landing. The Station has designed several experimental models of this kind which operate well under laboratory conditions. Since there is neither time nor the facilities at sea for gutting and filleting fish before freezing, the apparatus which has been designed would handle fish as they are caught

with a minimum of processing; they are merely poured into freezing panels and quick-frozen into slabs which are then to be stored in refrigerated compartments. Their studies have shown that ungutted fish, quick-frozen to a temperature of about -20° F. and kept at that temperature will retain indefinitely all the properties of freshly-caught fish. When ready to be offered for sale, the slabs would merely be thawed and the fish treated as if they were freshly-caught. The principal problem, as might be expected and which will be next to insurmountable, is that of cost.

Fish Curing: These experiments are directed toward improving the curing process by making it more effective and at the same time more rapid and less expensive. To replace the present smoking chambers which burn wood under normal conditions and which makes the smoking process a rather lengthy one, experimental laboratory models of curing chambers have been built which utilize sawdust raised electrically to a heat which causes smoke without a blaze and which is said to be a more efficient and effective use of fuel. Coupled with this system, the scientists are experimenting with a system of polarization within the chamber which attracts the smoke directly on to the fish in cure with a view to expediting the process and to getting a heavier and more uniform layer of smoke on the fish. One problem which still proves difficult is how to obtain the proper degree of dehydration in the quick smoking process.

Venezuela

FISH CANNERS WANT MARKETING MONOPOLY: The fish canners want a fish-marketing monopoly somewhat similar to that engineered for sugar. The reason is that some canners are cutting prices and those who deplore this unorthodox marketing feel that an industry marketing monopoly would control these unfair methods. The orthodox canners (price maintainers) say that there is an actual scarcity of fish due to the fish-meal plant that converts whole fish into animal feed and that the spectacle of some canners reducing prices when the warehouses are still not filled with fish in cans is contrary to all reason. Probably the explanation of this extraordinary procedure is that some canner has old stocks, points out a July 10, 1956, report from the United States Embassy at Caracas.

Of course, the canners are not unaware of the fact that the sugar monopoly received Government-supported credit to carry its sugar supplies through to marketing. The fish canners have often urged that the Government finance their unsold pack and a fish marketing monopoly would give them an excellent chance to ask for the same treatment given the sugar monopoly.

* * * * *

MANUFACTURE OF FISH MEAL FROM WHOLE FISH PROHIBITED: The Venezuelan Ministry of Agriculture has announced in the press that the permit to convert whole herring into fish meal not be renewed. The Ministry stated the original permit was granted only on a trial basis and the conclusion has been reached to limit the production of fish meal to that made from fish scraps or waste, states a July 11 dispatch from the United States Embassy at Caracas.

Fish meal operations furnished a constant market for the fishermen and had some effect on stabilizing fish prices.

* * * * *

TERRITORIAL WATERS, CONTINENTAL SHELF, AND FISHERIES LAW: A new law governing Venezuelan territorial waters, the continental shelf, and fisheries was published in Extraordinary Number 496 of the Official Gazette on August 17,

1956. The new law proclaims a 12-mile limit for Venezuelan territorial waters, according to an August 27 dispatch from the United States Embassy at Caracas.

In general, with respect to surface waters, the law sets up the following zones:

(1) "Territorial Sea" over which the State exercises "national sovereignty": low tide base line to 12 nautical miles (23 kilometers and 224 meters) seaward.

(2) "Contiguous Zone" subject to "maritime vigilance and police" action of the State: three nautical miles (5 kilometers and 556 meters) wide zone adjacent to and measured from the outer limits of the "territorial sea."

(3) Maritime Conservation zones subject to "authority and vigilance" of the State: unspecified maritime zones "outside of the territorial sea or the contiguous zone" the limits of which "shall be fixed" by the State.

Vietnam

CANNED SARDINE MARKET: Domestic production of canned sardines in Vietnam is carried on by only one small plant having a daily capacity of 8,000 360-gram cans (12⅓-oz.), reports a July 23 United States Embassy dispatch from Saigon. The output of this plant from the beginning of operations in January 1956 to mid-July consisted of 92,000 cans of pilchards in tomato sauce, or only about 35 metric tons (net weight). The factory has recently received additional equipment for handling cans of 122 grams (4½-oz.), which is the most popular size in that country.

The low volume of canned fish production is explained by the preference of the indiginous population for fresh fish, as well as for dried and, more recently, smoked fish.

Before 1956 consumption of canned sardines in Vietnman was satisfied entirely by imports. In the first half of this year domestic production contributed about 12 percent of the greatly reduced supply.

Consumption of sardines in Vietnam has been declining rapidly, and a further decline from the current level of consumption appears most likely. This development is due to the withdrawal of the French Army and of a large portion of the French civilian population, which had been the chief consumers of sardines. The

Vietnam Retail Prices for Canned Sardines

Size	Prices in VN$			Prices in U.S. Cents		
	Tomato	Olive Oil	Vegetable Oil	Tomato	Olive Oil	Vegetable Oil
122 grams (4⅓-oz.) flat . .	5.50-10.00	8.00-16.00	7.00-12.00	16-29	23-46	20-34
360 grams (12⅓-oz.) ovals:						
Imported	12.00-20.00	-	-	34-57	-	-
Domestic	10.00-14.00	-	-	29-40	-	-

Note: Values converted to US$ equivalent at the official rate of exchange applicable to imports of VN$1 equal to US$0.02857.

percentage of sardines consumed by the high, middle, and low income groups is estimated at 20, 50, and 30 percent, respectively. The low income level and the food habits of the indiginous population are not conducive to the purchase of relatively high-priced canned fish products, particularly since an abundant supply of fresh and dried fish is available.

Only three sizes of cans are known in the market. About 60 percent of the consumers use the 122-gram (4½-oz.) flats; 25 percent the 360-gram (12⅓-oz.) ovals; 10 percent the 1-lb. rectangular; and 5 percent other sizes. About 60 percent of the sardines consumed are packed in tomato sauce; 15 percent in olive oil; 15 percent in vegetable oil; and 10 percent in other condiments.

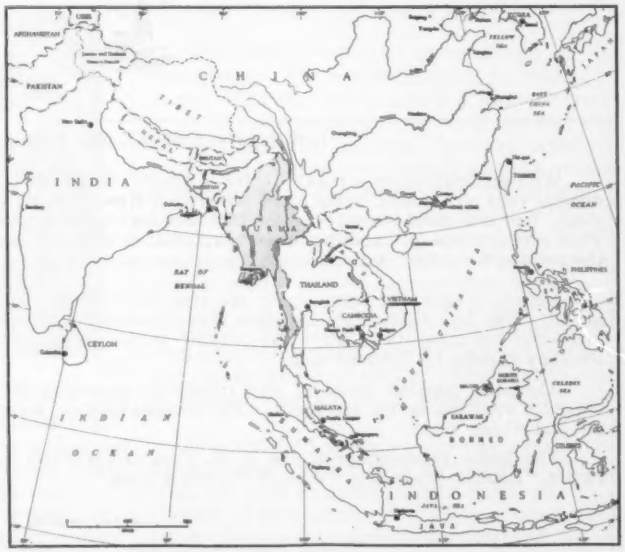
Retail prices are subject to wide fluctuations, depending upon availability of supplies (see table).

During the colonial period, sardines were imported almost entirely from France and its possessions, under a system of preferential trade. In 1955 limited quantities of sardines and other canned fish were imported from the United States under the American Aid Commercial Import Program. In the fall of 1955, licensing of such imports under the American Aid Commercial Import Program was discontinued on the grounds that these products constituted luxury commodities for which foreign exchange should not be expended. Imports from the United States since then have consisted of small lots for the limited high-price market and are financed out of EFAC account currencies (foreign exchange retentions held by exporters), except for arrivals against Commercial Import Program licenses approved during calendar year 1955. For fiscal year 1956/57 no foreign exchange is being earmarked for sardines under the American Aid Commercial Import Program. Total imports of sardines in the first half of 1956 have been at approximately one-third the rate of last year's imports.

Canned sardines are imported by importers of general merchandise or directly by wholesale grocers and are distributed by them to retail stores and food peddlers.

* * * * *

JAPAN-VIETNAM COMMERCIAL FISHING AGREEMENT INAUGURATES DEEP-SEA FISHING: The first private commercial fishing agreement has been concluded recently between Vietnam and Japan through the cooperation of the Vietnamese Fishing Service, the Office of the Director General of Commerce of Vietnam, and the United States Operations Mission. The agreement which assures the Vietnamese people of large stocks of fish at reduced prices calls for the renting of eight Japanese fishing boats with Japanese captains and crews by four Vietnamese companies. Especially important for Vietnam is the section of the contract which stipulates that a certain percent of the personnel during the fishing operations shall be Vietnamese who will be trained in the science of deep-sea fishing by the Japanese experts.



Two of the boats have already arrived and have been delivered to the Nam-Anh Fisheries Company. They are of the purse-seine type, modern in every respect, and weigh about 6 tons each. They are equipped with freezing units and sonar devices to detect the schools of fish. Freezers have also been installed in the participating Vietnamese firms so that the fish will remain frozen until taken to market, assuring the people a constant supply of fish without the usual danger of spoilage.

Vietnamese fishing has, in the past, been confined to canals, rivers, and close-to-shore operations as their boats were unsuited to open-sea operations. With the opening up of these new fishing grounds, which will in no way infringe on those already established, the Vietnamese will have many more kinds of fish to choose from and a greatly increased supply at reduced prices. With fresh fish within the reach of everyone, the health of the nation should be noticeably improved.

The results of several weeks of trial runs for the two boats were more than satisfactory. Experts agreed that the quality of the fish was top grade and that freshness would now be assured the consumers.

According to the Director of the Nam-Anh Fisheries Company Tran-Van-Tiet, each boat will make three trips a month. To date, each trip has brought in between 20 and 25 metric tons of fish. The immediate result was a drop in the average retail price. The six additional boats which will be delivered soon to the three other companies, should improve the situation still further.

Yugoslavia

NEW FISH CANNERIES AND MEAL PLANTS: Four new fish canneries and two fish-meal plants have been built on the Yugoslav Adriatic Coast, according to press reports from that country reprinted in Fiskets Gang (August 9, 1956), a Norwegian fishery periodical. The fish-meal plants will produce meal and oil for the domestic market, but the canneries will pack fish primarily for export.

LOBSTER--A MEAL FIT FOR A KING

Who wouldn't enjoy a meal "fit for a king?" Northern lobsters certainly fill the bill. These crustaceans are found in the cold waters off New England and Canada. They can be caught all year, but are most plentiful in the late summer months when they come in closer to the shore. This modern age of handling and transportation makes it possible for people far inland to enjoy the lobster's tender, delicately-flavored, succulent meat.

Lobsters must be alive up to the time of cooking. The live lobster's natural color is dark green. The live lobster should show movement of the legs, and the "tail" should curl under the body and not hang down when the lobster is picked up. During cooking, the color of the shell changes rapidly to "lobster red."

The four popular sizes of live lobsters, generally weighing from one to three pounds are chicken, quarter, large, and jumbo. The chicken lobster, weighing one pound, is the most economical and widely used.

The home economists of the U. S. Fish and Wildlife Service suggest that you serve your family "Lobster Newburg," a meal "fit for a king."

LOBSTER NEWBURG

¾ POUND COOKED LOBSTER MEAT	DASH CAYENNE PEPPER
¼ CUP BUTTER OR MARGARINE	1 PINT COFFEE CREAM
2 TABLESPOONS FLOUR	2 EGG YOLKS, BEATEN
1 TEASPOON SALT	2 TABLESPOONS SHERRY
¼ TEASPOON PAPRIKA	TOAST POINTS

Cut lobster meat into ½-inch pieces. Melt butter; blend in flour and seasonings. Add cream gradually and cook until thick and smooth, stirring constantly. Stir a little of the hot sauce into egg yolk; add to remaining sauce, stirring constantly. Add lobster meat; heat. Remove from heat and slowly stir in sherry. Serve immediately on toast points. Serves 6.

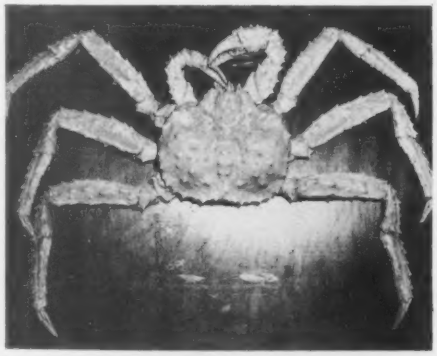
FEDERAL ACTIONS

Federal Trade Commission

PRICE FIXING ON KING CRABS IN ALASKA CHARGED:

A Kodiak, Alaska, affiliate of the Seafarers International Union of North America (American Federation of Labor), was found September 10, 1956 (Intial Decision, Docket No. 6368, King Crabs) by a Federal Trade Commission hearing examiner to be engaging in conspiracy and coercion to fix the prices of raw king crab.

This is not a final decision of the Commission and may be appealed, stayed, or docketed for review.



Alaska king crab (Paralithodes camtschatica)

Examiner William L. Pack held that the conspiracy may enhance the price the public ultimately must pay for king crab. He said the conspiracy includes the Union, an association of boat owners or captains, and three canners in the area.

The examiner found that the union and the association also used coercive methods against a fourth canner, who in 1954 refused to pay the fixed price for crabs.

The relatively new king crab industry began in the Kodiak area about five years ago. It has experienced rapid growth, and now the annual wholesale value of the king crab pack is between two and three million dollars.

A king crab weighs from 8 to 20 pounds and is considered a delicacy. A case of 48 $\frac{1}{2}$-pound cans of meat wholesales for about $30.

Since 1952, the examiner said, negotiations between the union or association and the canners have resulted in a fixed price paid by canners to the vessel owners for the live crabs. In 1954 and 1955 this price was $9\frac{1}{2}$ cents a pound.

Evidence presented at hearings in Washington State and Alaska, he said, shows that the union and the association in 1955 used coercive tactics against a Port Wakefield, Alaska, cannery which refused to pay more than 8 cents a pound. The examiner found that the cannery officials were told by an association official that unless the company signed up at $9\frac{1}{2}$ cents, it would not be allowed to operate; that it would get no crabs; that if any fishing boat attempted to sell at 8 cents, it would get into trouble; that an association official would make trouble for the company with the labor union; and that the company would have trouble with its gear.

In another instance, the examiner said, a boat owner who had intended to fish for that cannery asked to be relieved of this obligation after a visit from the same association official. When attempting to hire workers for the cannery, the examiner continued, cannery officials found that union members, willing to accept jobs, were afraid lest they incur the displeasure of the union. On one occasion the cannery officials went to

union headquarters in Kodiak where a large number of cannery workers were available for work. The union's secretary, however, refused to let them work unless the cannery agreed to pay the fixed price.

The Commission's complaint in this proceeding was issued June 27, 1955.

Two of the three canners named in that complaint agreed to accept a consent order which was approved and issued by the Commission May 3. One of these two companies was of Seattle, and the other of Kodiak. The third cannery of Kodiak, did not answer the charges and is in default. Accordingly Mr. Pack on September 10 issued an order against this company.

The examiner noted in his decision involving the union that it is difficult to distinguish between the union and the association. In fact, he said, the association was formed in 1954 as the representative of boat owners or captains who had been union members prior to that time. The reason for this move was the decision of the union that the two groups, crew members and boat owners, would have to be separate. The examiner also noted that the principal officers of the association had been the principal officers of the union. In addition, the association was given a third interest in the union's assets including one-third interest in the Union Hall.

"It is difficult to escape the impression that the purported separation of boat owners and crew members was more technical than real; that actually the union is continuing to fix prices, using the association as a means to that end," the examiner said.

The examiner issued an order which specifically would prohibit the union and association from continuing any of the following activities:

(1) fixing or attempting to fix any price at which king crab or crab meat is to be purchased or sold; (2) jointly or collectively negotiating as to any such price; (3) coercing or compelling purchasers or sellers of king crab or crab meat to adhere to any price; (4) preventing or attempting to prevent any person from accepting or retaining employment in a cannery or other establishment processing king crab, with the purpose or effect of causing the establishment to maintain any particular price.

The order, however, would not be construed to prevent the following things:

(1) any respondent, individually, from negotiating with any canner or processor; (2) any association of bona fide fishermen from acting in accordance with the Fishermen's Cooperative Marketing Act; (3) collective bargaining between the union and any employer with respect to wages, hours, and working conditions of union members.

SEAWEED FOR SLIMMING

German scientists have discovered the slimming powers of seaweed. By drinking a simple concoction made from seaweed jelly, the appetite is reduced and the need for drastic dieting vanishes.

The drink, which is harmless and contains no fattening matter, forms a jelly-like lump in the stomach, which takes several hours to digest and thus discourages eating. The drink is prepared by dissolving the jelly in water.

--The Fishing News, September 14, 1956.

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

Legend:
1956
1955

MAINE

CUMULATIVE DATA
8 Mos. 1956 - 185.6
8 " 1955 - 173.2
12 " 1955 - 255.4

MASSACHUSETTS

CUMULATIVE DATA
6 Mos. 1956 - 221.8
6 " 1955 - 216.3
12 " 1955 - 321.6

FLORIDA

CUMULATIVE DATA
6 Mos. 1956 - 99.8
6 " 1955 - 87.6
12 " 1955 - 174.3

LOUISIANA 2/

CUMULATIVE DATA
9 Mos. 1956 - 37.6
9 " 1955 - 52.7
12 " 1955 - 57.3

2/ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.

NEW JERSEY

CUMULATIVE DATA
8 Mos. 1956 - 419.6
8 " 1955 - 283.0
12 " 1955 - 412.2

TEXAS

CUMULATIVE DATA
8 Mos. 1956 - 82.4
8 " 1955 - 89.1
12 " 1955 -124.9

CALIFORNIA 1/

CUMULATIVE DATA
9 Mos. 1956 - 481.1
9 " 1955 - 370.6
12 " 1955 - 639.5

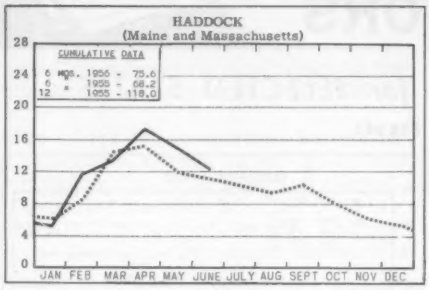
OREGON

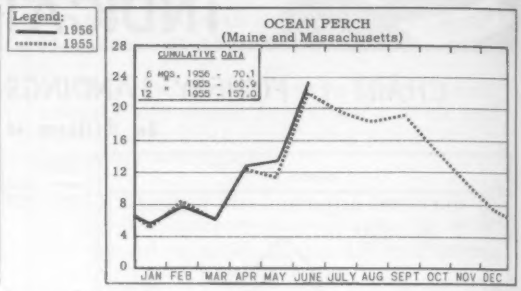
CUMULATIVE DATA
8 Mos. 1956 - 44.7
8 " 1955 - 33.3
12 " 1955 - 49.5

1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

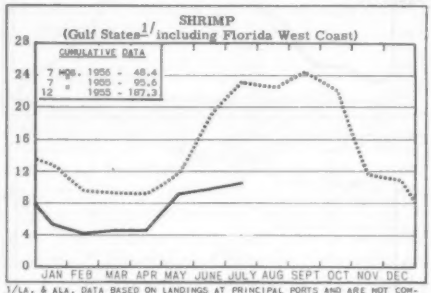
CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

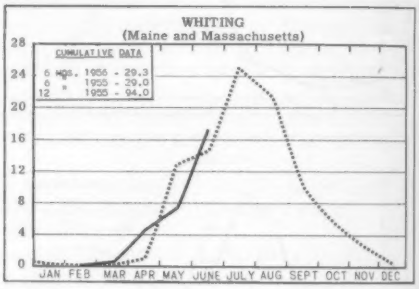

HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
6 MOS. 1956 - 75.6
6 " 1955 - 58.2
12 " 1955 - 118.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



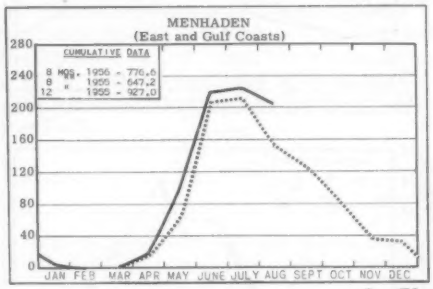
In Millions of Pounds

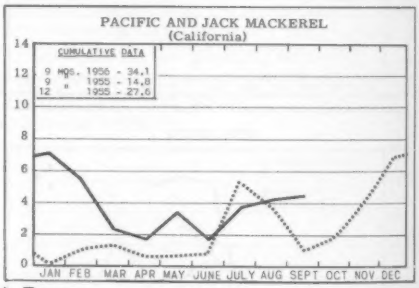

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
7 MOS. 1956 - 48.4
7 " 1955 - 95.6
12 " 1955 - 187.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

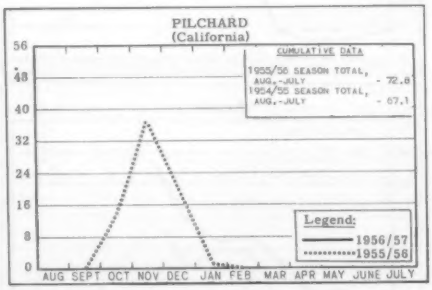

WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
6 MOS. 1956 - 29.3
6 " 1955 - 29.0
12 " 1955 - 94.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

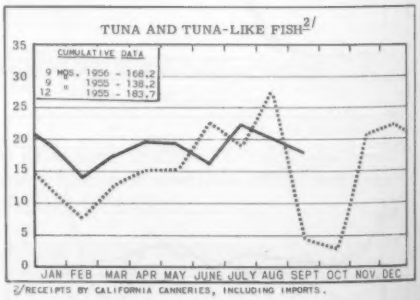
In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
8 MOS. 1956 - 776.6
8 " 1955 - 647.2
12 " 1955 - 927.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
9 MOS. 1956 - 34.1
9 " 1955 - 14.8
12 " 1955 - 27.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons

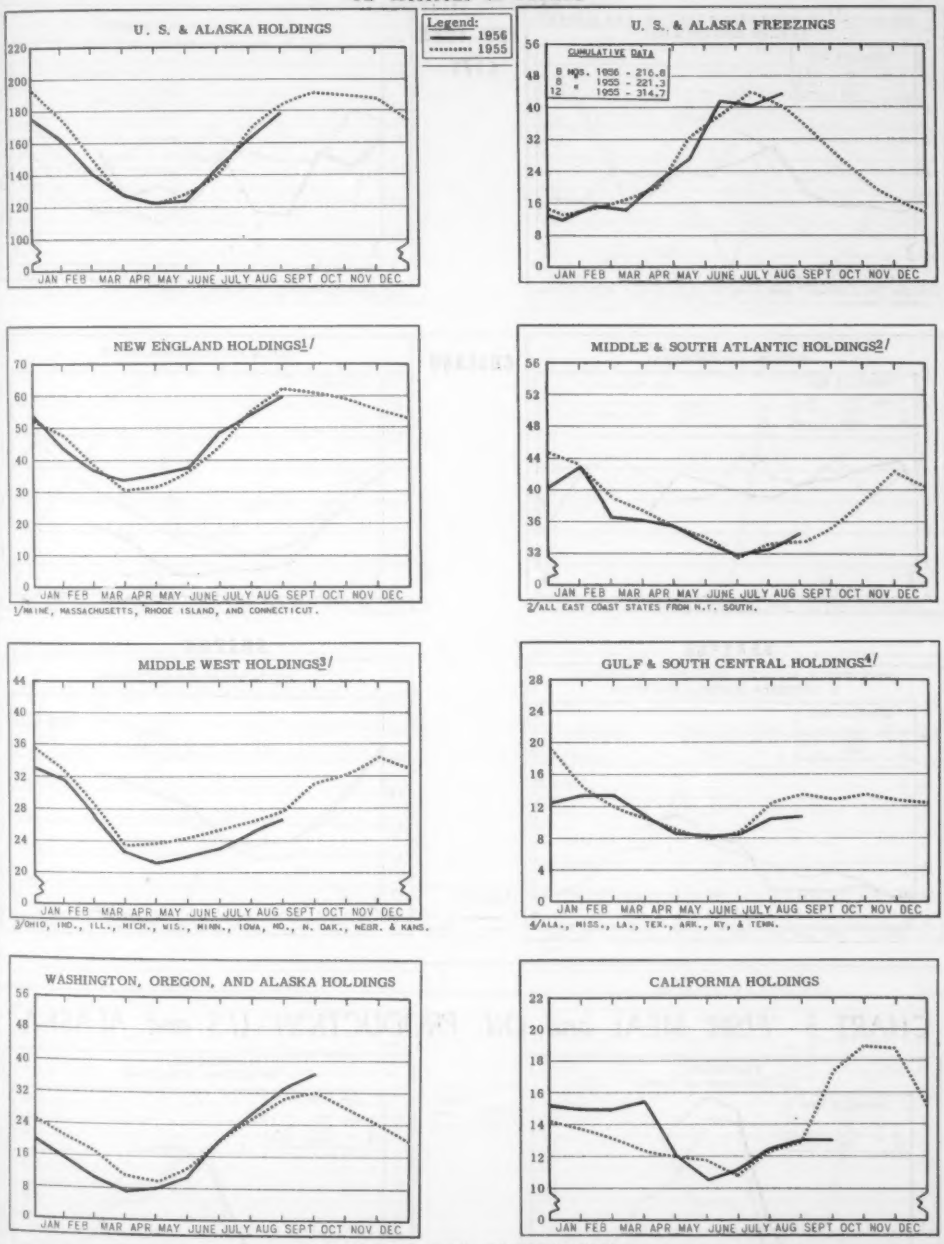



TUNA AND TUNA-LIKE FISH 2/
CUMULATIVE DATA
9 MOS. 1956 - 168.2
9 " 1955 - 138.2
12 " 1955 - 183.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/RECEIPTS BY CALIFORNIA CANNERIES, INCLUDING IMPORTS.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. & ALASKA HOLDINGS
Legend:
1956
1955
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
U. S. & ALASKA FREEZINGS
CUMULATIVE DATA
8 MOS. 1956 - 216.8
8 " 1955 - 221.3
12 " 1955 - 314.7
NEW ENGLAND HOLDINGS1/
MIDDLE & SOUTH ATLANTIC HOLDINGS2/
MIDDLE WEST HOLDINGS3/
GULF & SOUTH CENTRAL HOLDINGS4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.

2/ALL EAST COAST STATES FROM N.Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY, & TENN.

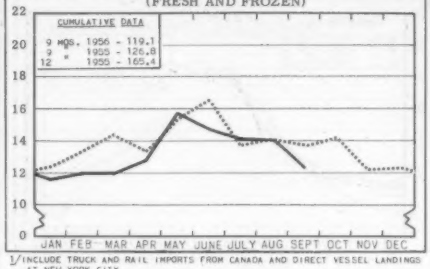
*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

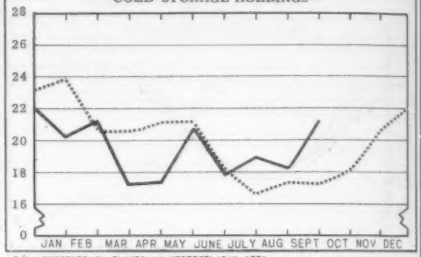
NEW YORK CITY

RECEIPTS[1] AT WHOLESALE SALT-WATER MARKET (FRESH AND FROZEN)



1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

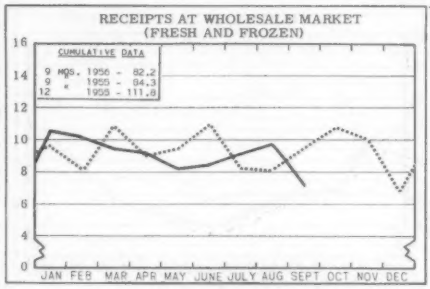
COLD-STORAGE HOLDINGS [2]



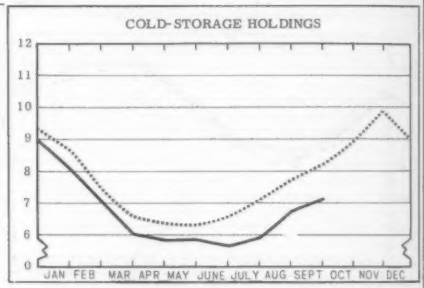
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHICAGO

RECEIPTS AT WHOLESALE MARKET (FRESH AND FROZEN)

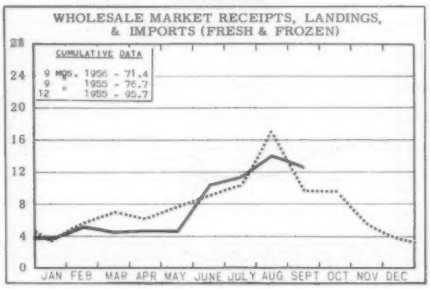


COLD-STORAGE HOLDINGS



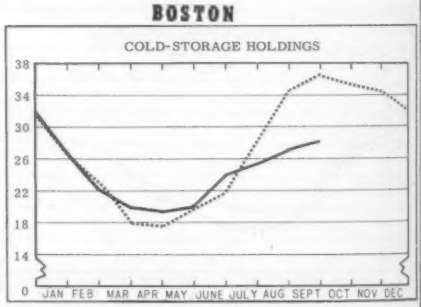
SEATTLE

WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (FRESH & FROZEN)



BOSTON

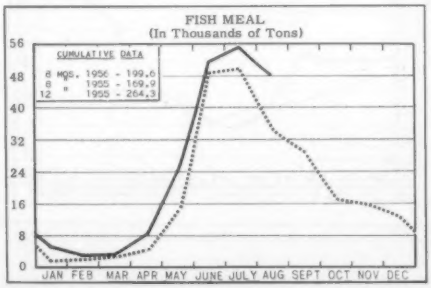
COLD-STORAGE HOLDINGS



Legend:
1956
1955

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

FISH MEAL
(In Thousands of Tons)



FISH OIL
(In Millions of Gallons)

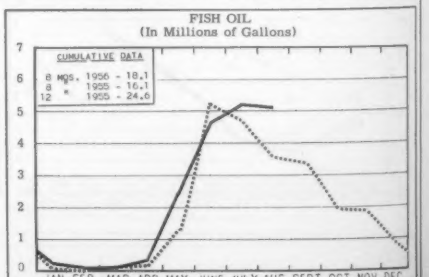
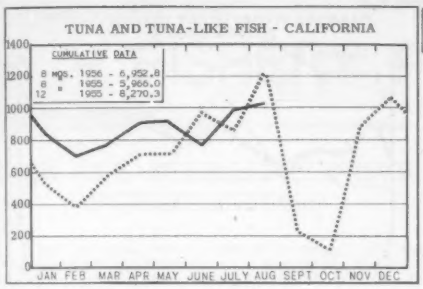
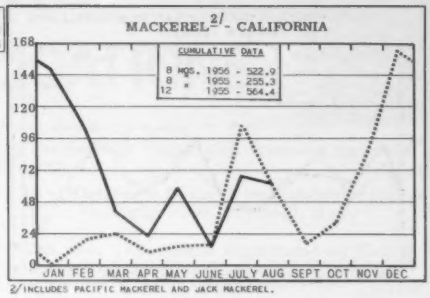


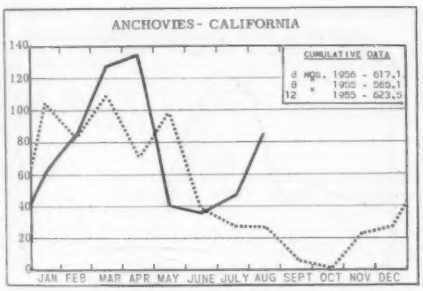
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

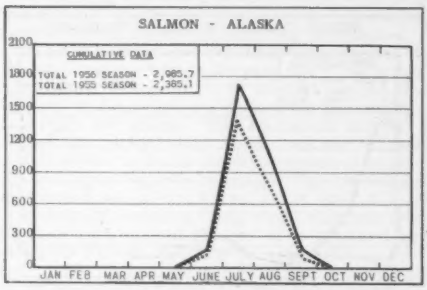
In Thousands of Standard Cases

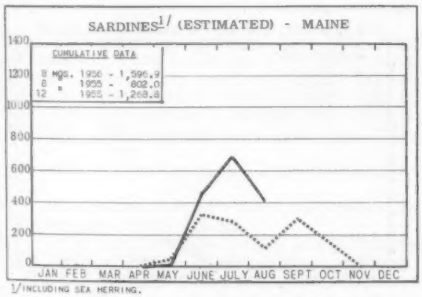

TUNA AND TUNA-LIKE FISH - CALIFORNIA
CUMULATIVE DATA
8 MOS. 1956 - 6,952.8
8 " 1955 - 5,966.0
12 " 1955 - 8,270.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


MACKEREL 2/ - CALIFORNIA
CUMULATIVE DATA
8 MOS. 1956 - 522.9
8 " 1955 - 255.3
12 " 1955 - 564.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.


ANCHOVIES - CALIFORNIA
CUMULATIVE DATA
8 MOS. 1956 - 617.1
8 " 1955 - 365.1
12 " 1955 - 623.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

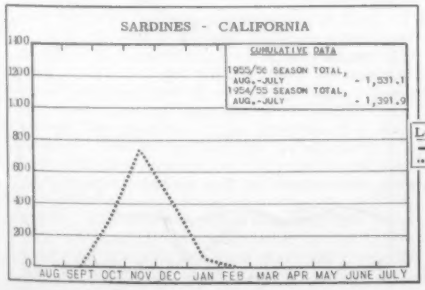

SALMON - ALASKA
CUMULATIVE DATA
TOTAL 1956 SEASON - 2,985.7
TOTAL 1955 SEASON - 2,385.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

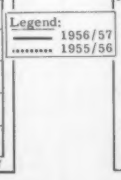

SARDINES 1/ (ESTIMATED) - MAINE
CUMULATIVE DATA
8 MOS. 1956 - 1,595.9
8 " 1955 - 802.0
12 " 1955 - 1,268.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.


SARDINES - CALIFORNIA
CUMULATIVE DATA
1955/56 SEASON TOTAL, AUG.-JULY - 1,531.1
1954/55 SEASON TOTAL, AUG.-JULY - 1,391.9
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY



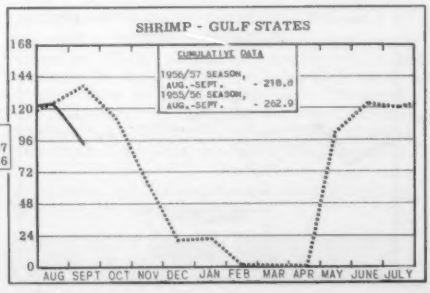
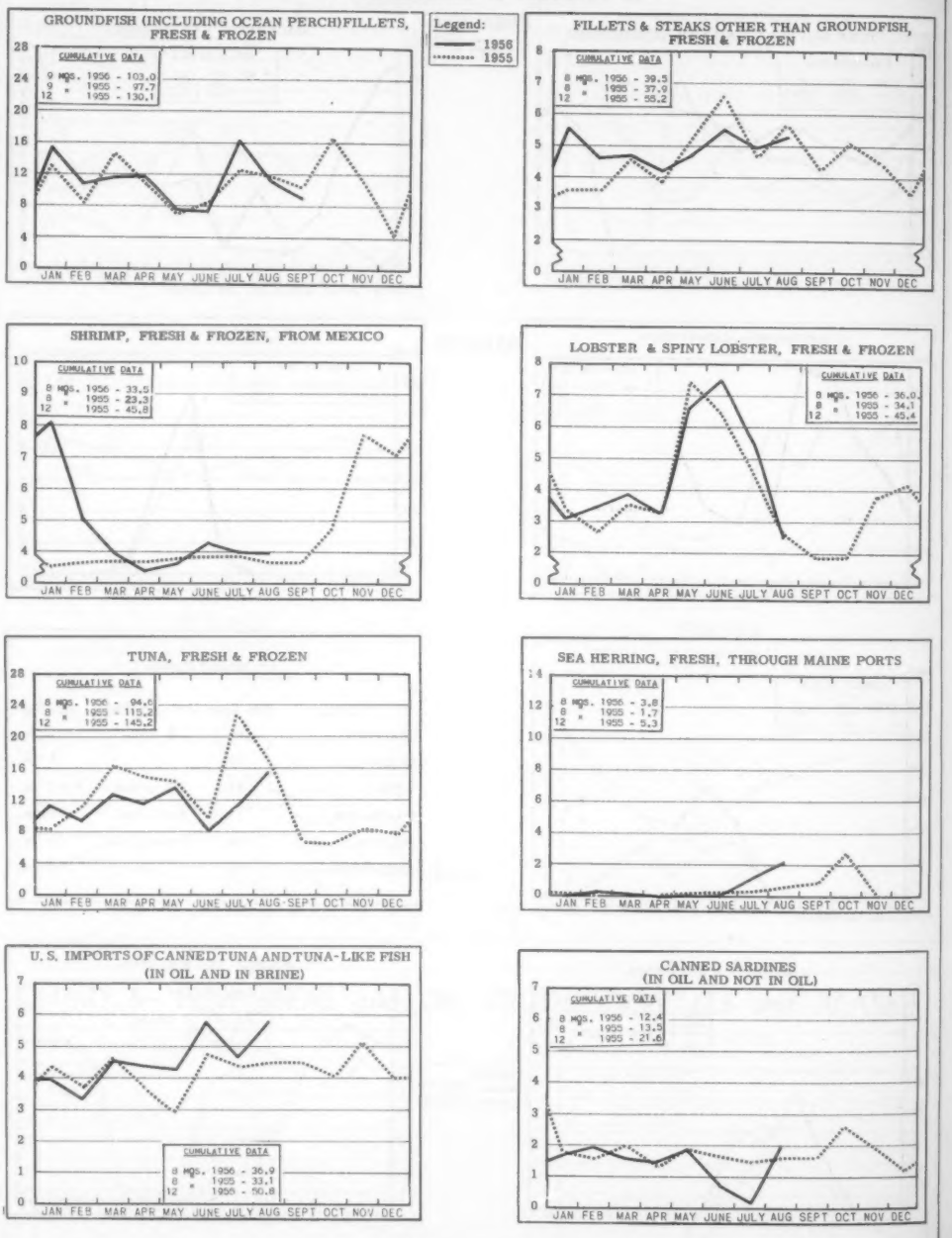
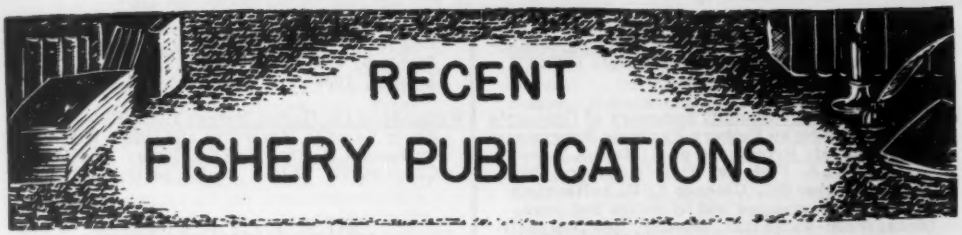

SHRIMP - GULF STATES
CUMULATIVE DATA
1956/57 SEASON, AUG.-SEPT. - 218.8
1955/56 SEASON, AUG.-SEPT. - 262.9
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (INCLUDING OCEAN PERCH) FILLETS, FRESH & FROZEN
CUMULATIVE DATA
9 MOS. 1956 - 103.0
9 " 1955 - 97.7
12 " 1955 - 130.1
Legend:
1956
1955
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
FILLETS & STEAKS OTHER THAN GROUNDFISH, FRESH & FROZEN
CUMULATIVE DATA
8 MOS. 1956 - 39.5
8 " 1955 - 37.9
12 " 1955 - 55.2
SHRIMP, FRESH & FROZEN, FROM MEXICO
CUMULATIVE DATA
8 MOS. 1956 - 33.5
8 " 1955 - 23.3
12 " 1955 - 45.8
LOBSTER & SPINY LOBSTER, FRESH & FROZEN
CUMULATIVE DATA
8 MOS. 1956 - 36.0
8 " 1955 - 34.1
12 " 1955 - 45.4
TUNA, FRESH & FROZEN
CUMULATIVE DATA
8 MOS. 1956 - 94.6
8 " 1955 - 115.2
12 " 1955 - 145.2
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
8 MOS. 1956 - 3.8
8 " 1955 - 1.7
12 " 1955 - 5.3
U. S. IMPORTS OF CANNED TUNA AND TUNA-LIKE FISH (IN OIL AND IN BRINE)
CUMULATIVE DATA
8 MOS. 1956 - 36.9
8 " 1955 - 33.1
12 " 1955 - 50.8
CANNED SARDINES (IN OIL AND NOT IN OIL)
CUMULATIVE DATA
8 MOS. 1956 - 12.4
8 " 1955 - 13.5
12 " 1955 - 21.6



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
FL - FISHERY LEAFLETS.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1340 - Massachusetts Landings (By Gear and Subarea), 1955 Annual Summary, 16 pp.
CFS-1369 - Florida Landings, April 1956, 6 pp.
CFS-1382 - Fisheries of the United States and Alaska, 1954 Annual Summary, 12 pp.
CFS-1385 - Texas Landings, June 1956, 3 pp.
CFS-1386 - North Carolina Landings, June 1956, 3 pp.
CFS-1387 - Georgia Landings, June 1956, 2 pp.
CFS-1388 - Shrimp Landings, June 1956, 4 pp.
CFS-1391 - California Landings, April 1956, 4 pp.
CFS-1393 - New York Landings, June 1956, 4 pp.
CFS-1394 - New Jersey Landings, June 1956, 4 pp.
CFS-1395 - Rhode Island Landings, June 1956, 3 pp.
CFS-1396 - Maine Landings, June 1956, 4 pp.

FL -336cc - Commercial Fisheries Outlook, July-September (1956), 36 pp.

FL - 427 - Cold Storage Design and Refrigeration Equipment (Part I - Refrigeration of Fish), by Charles Butler, Joseph W. Slavin, Max Patashnik, and F. Bruce Sanford, 146 pp., illus., processed, June 1956. Part I in a series of five leaflets on the refrigeration of fish. The first section of this leaflet is concerned with design and construction of single and multi-story cold-storage warehouses, the economics governing the type of construction and design selected, and that amount of technical data required for guidance of the processor in his choice. The second section is concerned with refrigeration equipment. A resume of the equipment available and the respective advantages and disadvantages for specific tasks is given. The third section develops the refrigeration requirements as affected by the type of load; the various freezing methods presently in use are then described and evaluated. Information on particular illustrative systems of freezing and of their respective freezing rates is presented.

SL - 15 - Wholesale Dealers in Fishery Products, Georgia, 1956 (Revised), 2 pp.

SSR-Fish. No. 179 - Sonic Equipment for Tracking Individual Fish, by Parker S. Trefethen, 14 pp., illus., processed, June 1956. Special sonic devices are being developed for obtaining detailed information on individual fish behavior. A miniature underwater sonic tag is attached to an adult salmon and the movements of the fish are observed on calibrated sonic receiving equipment. The position of the fish can be pinpointed, and movements plotted for periods of time up to 100 hours. The equipment can be used in varied hydraulic conditions and in fresh or salt water to track the movements of adult fish and other aquatic animals. The transducer is attached behind the dorsal fin of adult salmon by a nickel-chromium "hog-ring" clamped into the back with special pliers. It is attached underwater without handling or immobilizing the fish. Visual observations indicate that the transducer does not affect the natural movements of an adult salmon.

SSR-Fish. No. 181 - Underwater Telemeter for Depth and Temperature, by F. H. Stephens, Jr., and F. J. Shea, 23 pp., illus., processed, June 1956. This report describes the construction of a telemetering depth-measuring instrument to be used with midwater trawling devices in exploratory fishing and gear research. The objective in developing an instrument of this type is to enable the research fishing vessel to lower the midwater trawl to the exact depth zone where concentrations of fish occur, as determined by echo-sounding equipment.

Sep. No. 447 - Development of the Pacific Coast Ocean Shrimp Fishery.

Sep. No. 448 - New Products from Fish Oils: Part II - Polyamino Fatty Acids Derived from Fish Oils.

Sep. No. 449 - Research in Service Laboratories (September 1956): Contains these short articles--"Tentative Method for Determining Coating Content of Frozen Fried Fish Sticks;" "Federal Specification for Chilled and Frozen Crab Meat;" "Prospects of Utilizing Lithium Salts of Fatty Acids from Fish Oils in Lubricating Greases."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

California Fishery Products Monthly Summary, July 1956, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts

of raw tuna and tunalike fish, herring, and squid; pack of canned tuna, mackerel, herring, anchovies, and squid; market fish receipts at San Pedro.

(Chicago) June 1956 Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Prices, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, July 1956, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July 1956, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Fishery production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

(New York) Monthly Summary - June 1956 - Receipts of Fishery Products at the New York City Wholesale Salt-Water Market, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces for the month indicated.

Landings and Prices of Fishery Products, Boston Fish Pier, 1955 (Includes "Trends in the Fishing Industry at Boston"), by John J. O'Brien, 22 pp., illus., processed, 1956. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Fish marketing trends and conditions in Boston for 1955 are discussed. Detailed data on landings and ex-vessel prices of fish and shellfish at the Boston Fish Pier during 1955 are presented. Statistics are given by months and species and by type of gear, together with comparative data for previous years.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Growth, Migrations, Spawning and Size Distribution of Shrimp PENAEUS SETIFERUS, by Milton J. Lindner and William W. Anderson, Fishery Bulletin 106 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 94 pp., illus., printed, 50 cents, 1956.

This is a Pondfish Hatchery (Rearing and Distributing Warm-Water Fish to Help Maintain Sport Fishing), Circular 40, 2 pp., illus., printed, 5 cents, 1956.

Wetlands of the United States (Their Extent and Their Value to Waterfowl and Other Wildlife), by Samuel P. Shaw and C. Gordon Fredine, Circular 39, 72 pp., illus., printed, $1, 1956.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

"Animal Sounds in the Sea," by Marie Poland Fish, Scientific American, vol. 194, no. 4, April 1956, pp. 93-95, 97-98, 100, 102, illus., printed, single copy 50 cents. Scientific American, 415 Madison Ave., New York 17, N. Y. During World War II underwater-sound men were puzzled to hear weird noises that were not made by ships. Now it is known that many marine species emit, among other sounds, chirps, whistles, grunts, and groans. The author describes in this article a study of the different sounds made by some fish and shellfish and how the sounds are made.

"Behavior of Fishes, Especially Concurrence of Reflectorial and Psychical Reactions in Electric Fishing," by Friedrich Schiemenz, Zeitschrift F. Fischerei, No. 5/6, 1952, printed in German. (Translated from German and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

(California) Statistical Report of Fresh, Canned, Cured, and Manufactured Fishery Products--Year 1955, Circular No. 30, 15 pp., printed. Marine Fisheries Branch, Department of Fish and Game, Sacramento 14, Calif., 1956. This is the 30th consecutive statistical report of fresh and processed fishery products produced in California. Through the annual publication of these figures, the State Legislature, commissioners, members of industry, sportsmen and other interested individuals and groups can obtain a picture of trends and developments. The tables are basically the same as in previous years. Two changes are included in this report. One involves a table which shows quantities of fish caught by sport anglers and processed for their use. In addition, the sole catch has been divided into its various components. The added table on processed sport fish shows only reported figures. Some of the processors did not separate the processed sport fish on their reports. In these instances the pack could not be extracted. The processing of sport fish is a growing industry. It enables the sportsman to preserve his catch for his own future use and thus eliminate waste. Landings of each species of fish, mollusk, and crustacean by the commercial fishing fleet are recorded in pounds. These landings are separated into seven general regions

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and totaled Statewide. General origin of the commercial catch and the volume of shipments are recorded. Shipment figures represent fish received for canning and processing. Total case pack is listed for each variety of fish according to container size and type of pack. The pack is kept separate for the Los Angeles and San Diego districts and for Central California. The latter includes all the area from the San Luis Obispo-Santa Barbara County line to the State's northern boundary. Most of the canning reported in the Central California category, however, is from Monterey and the San Francisco Bay area. Other fishery products processed in California are recorded. The combined volume of canned and smoked sport-caught fish is listed. All the information on production used in these tables is obtained from monthly and annual reports submitted by the industry. Sardine landings and the products manufactured are recorded. Total annual case pack of anchovy, tuna, bonito, and yellowtail in various sizes of containers has been equated to the most common pack size for each variety.

(Canada) Journal of the Fisheries Research Board of Canada, vol. 13, no. 3, May 1956, pp. 273-448, illus., printed. Fisheries Research Board of Canada, Ottawa, Canada. Contains, among others, the following articles: "Spoilage of Fish in the Vessels at Sea: 4. Effect of Removal of Gills on Rate of Spoilage," by C. H. Castell and Maxine F. Greenough; "The Behaviour of Migrating Pink and Chum Salmon Fry," by William S. Hoar; "Interspecific Competition and Population Control in Freshwater Fish," by P. A. Larkin; "On the Specific Identity of the Larval Porrocaecum (Nematoda) in Atlantic Cod," by D. M. Scott; "Climatic Trends and Fluctuations in Yield of Marine Fisheries of the Northeast Pacific," by K. S. Ketchen; and "An Investigation of the Electrical 'Spike' Potentials Produced by the Sea Lamprey (Petromyzon marinus) in the Water Surrounding the Head Region," by H. Kleerekoper and Kira Sibakin.

(Connecticut) Report of the Shell-Fish Commissioners (July 1953-July 1955), 18 pp., printed. Connecticut Shell-Fish Commission, 185 Church St., New Haven, Conn., 1955.

"Contribution to Study of Size, Age and Growth of the Sardine (Sardina pilchardus Walbaum) from the Eastern Coasts of Spain," by B. Andreu, Roda J. Rodriguez, and M. Gomez Larranete, Publicaciones del Instituto de Biologia Applicada, Barcelona, 7, pp. 159-189, 1950, printed in Spanish. (Translated from Spanish and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

Cooking Frozen Meats, Poultry, Game, and Fish, by Faith Fenton, Cornell Extension Bulletin 906, 15 pp., illus., printed. New York State College of Agriculture, Extension Service, Cornell University, Ithaca, N. Y., revised January 1956.

"Difficulties Involved in Echo-Sounding Over a Sloping Bottom," by J. Scharfe, article, Fischereiwelt, vol. 4, no. 7, July 1952, pp. 99-101, printed in German. (Translated from the German by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"Effect of Aureomycin Chlortetracycline on Fish Freshness," by M. C. Firman, A. Abbey, M. A. Darken, A. R. Kohler, and S. D. Upham, article, Food Technology, vol. 10, no. 8, August 1956, pp. 381-384, printed, single copies of periodical: domestic US$1.50, foreign US$1.75. The Garrard Press, 119 West Park Ave., Champaign, Ill. (Published by the Institute of Food Technologists.) The fresh quality of fish has been successfully prolonged by the antibiotic chlortetracycline applied as an ice, a dip, or a freezing brine. Antibiotic activity has been detected in the raw treated fish, and microbial counts and organoleptic observations have substantiated the effectiveness of chlortetracycline in extending the storage life of freshly-caught fish. The fish investigated include sea bass, sea trout, croaker, butterfish, haddock, scup, salmon, and halibut.

Federal Statistical Directory, Seventeenth Edition, 162 pp., processed, 75 cents. Office of Statistical Standards, Bureau of the Budget, Washington, D. C., June 1956. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This directory lists the professional and technical personnel of Federal agencies (including the Fish and Wildlife Service) engaged in statistical activities, including reporting, planning, research, data collection, and analysis in economics and other social sciences.

Fish for Hospital Catering, 24 pp., illus., printed. White Fish Authority, London, England. Provides general hints on the preparation of fish and fish cookery, written primarily for use in hospitals. Includes an article by a physician on the therapeutic value of fish, who also contributes a table of food values of white fish. Also includes items on choosing fish for normal and special diets; buying fish; the preparation and storage of fish; hygiene; cooking, serving, and garnishing fish; keeping fish hot; fish for normal diets, and for the staff; and fish for special diets.

(FAO) Report to the Government of Pakistan on a New Fish Harbour for Karachi (Part One--Text; Part Two--Plans), by A. Van den Berg and H. van Pel, FAO Report No. 26, illus., processed, limited distribution. Food and Agriculture Organization of the United Nations, Rome, Italy, March 1952. This report is divided into two parts. Part I contains a summary of the findings of a survey made in 1951 by FAO experts and their recommendations for a new fish harbor at Karachi. It discusses the existing system of landing and transport of fish in the Karachi area; necessity and location of a new fish harbor; principal factors affecting the plan of a new fish harbor; plans of the new fish harbor--general arrangement and accommodation; administration and management of the new fish harbor; economic and financial aspects;

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and harbor works in other fishing centers. Part II contains a map of the fishing villages in the Karachi area; drawings of aluminum fish boxes and rattan baskets; and general plans and details of a new fish harbor, fish market, ice-making and cold-storage plant, etc.

Field and Laboratory Tests to Develop the Design of a Fish Screen Structure, Delta-Mendota Canal Headworks, Central Valley Project, California, by Dale M. Lancaster and T. J. Rhone, Hydraulic Laboratory Report No. Hyd-401, 90 pp., illus., processed. Division of Engineering Laboratories, Bureau of Reclamation, Denver, Colo., March 21, 1955.

"Fishes of the Northern Seas of Russia," by A. P. Andriiashev, article, Guides to the Fauna of the USSR, vol. 53, 566 pp., printed in Russian. Zoological Institute of the Academy of Sciences of the USSR. (Excerpts translated by C. Richard Robins from Ryby Severnykh Morei SSSR. Opredeliteli po Faune SSR, Isdavaemye Zoologicheskim Institutom Akademii Nauk SSSR.)

"Fisket ved Vest-Gronland, 1955" (Fisheries of West Greenland, 1955), by Knut Friis, article, Fiskets Gang, no. 24, June 14, 1956, pp. 342-348, illus., printed in Norwegian with brief summary in English. Fiskeridirektoren, Postgiro Nr. 691 81, Bergen, Norway. Statistics are given on the catch of cod and halibut off West Greenland during 1955. The number of vessels participating in these fisheries are also given as well as the average yield per day. The landings amounted to 14,325 metric tons of salted cod and almost 881 tons of fresh or frozen halibut.

"Fluctuations in Catch of the South Sakhalin Herring and Their Causes," by A. N. Svetovidov, article, Zoologicheskii Zhurnal, vol. 31, no. 6, 1952, pp. 831-842, printed in Russian. (Translated from Russian by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"Form and Size of the 'Zone of Detection' in Echo-Sounding," by J. Scharfe, article, Fischereiwelt, vol. 4, no. 2, February 1952, pp. 6-8, printed in German. (Translated from German by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"Forecasts of Catch and Overfishing of Herring," by Schubert, article Die Fischwirtschaft, vol. 5, no. 9, pp. 218-219, printed in German. (Translated from German and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"Hydrobiology and Fisheries Management," by P. L. Pirozhnikov, article, Zoologicheskii Zhurnal, vol. 31, no. 1, 1952, pp. 99-109, printed in Russian. (Translated from Russian and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C.)

(ICA) Operations Report, Data as of March 31, 1956, FY 1956, Issue No. 3, 71 pp., illus., processed. Office of Statistics and Reports, International Cooperation Administration, Washington 25, D. C.

(International Law Commission) Comments by Governments on the Provisional Articles Concerning the Regime of the High Seas and the Draft Articles on the Regime of the Territorial Sea Adopted by the International Law Commission at its Seventh Session, A/CN.4/99, 49 pp., processed. United Nations--General Assembly, International Law Commission, New York, N.Y., March 12, 1956.

(International Law Commission) Comments by Inter-Governmental Organizations on Articles Regarding Fishing Embodied in the Provisional Articles Concerning the Regime of the High Seas Adopted by the International Law Commission at its 7th Session, A/Cn.4/100, 4 pp., processed. United Nations--General Assembly, International Law Commission, New York, N. Y., March 13, 1956.

(International Law Commission) Regime of the High Seas and Regime of the Territorial Sea (Report), by J. P. A. Francois, Special Rapporteur, A/CN.4/97, 32 pp., processed. United Nations--General Assembly, International Law Commission, New York, N. Y., January 27, 1956.

(International Law Commission) Regime of the High Seas and Regime of the Territorial Sea (Addendum to the Report), by J. P. A. Francois, Special Rapporteur, A/CN.4/97/Add.1, 24 pp., processed. United Nations--General Assembly. International Law Commission, New York, N. Y., May 1, 1956. Summary of replies from Governments and conclusions of the Special Rapporteur.

(International Law Commission) Regime of the High Seas and Regime of the Territorial Sea (Addendum to the Report), by J. P. A. Francois, Special Rapporteur, A/CN.4/97/Add.2, 23 pp., processed. United Nations--General Assembly, International Law Commission, New York, N.Y., May 4, 1956. Summary of replies from Governments and a continuation of the conclusions of the Special Rapporteur.

(International Law Commission) Regime of the High Seas (The Right of International Organizations to Sail Vessels under their Flags), by J. P. A. Francois, Special Rapporteur, Supplementary Report, A/CN.4/103, 4 pp., processed. United Nations--General Assembly, International Law Commission, New York, N. Y., May 8, 1956.

Is the Shrimp Trawl Net Destructive to Marine Life? (A Survey of the Literature), by Francis B. Taylor, 52 pp., processed. Bears Bluff Laboratories, Wadmalaw Island, S. C., June 1956. It has been charged that otter trawling is the cause of depletion in the supply of fish, crab, and shrimp in the waters of South Carolina. The availability or unavailability of these fish and shellfish may depend upon a variety of factors, but in the public mind, or a segment of it at any rate, the shrimp trawl fishery is held solely responsible. It is precisely because the supply

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of these fish for sports fishing, at least, seems to have declined (not remained the same) in the face of expanded and intensified commercial trawling for shrimp and crab, that the complaints have become so bitter against the otter trawls' destructiveness. The purpose of this paper is to report upon a survey of the scientific literature on the subject, rather than to argue the point. A broad field of marine biological and oceanographic literature was reviewed for facts that bear upon the complaints, and appropriate data were extracted. Whatever was found to be pertinent, pro or con, is presented in this paper. Comment is offered simply to tie the parts together. The evidence presented treats only with the complaints about damage done by bottom trawling in the waters of South Carolina. It does not concern itself either with the fate of the prime reason for this trawling--the Peneid shrimp of commerce, nor the possibility that noncommercial fishing has any bearing on the stocks of sports fishes.

Journal du Conseil, vol. XXI, no. 2, 121 pp., illus., printed, single copy Kr. 12 (US$1.74). Messrs. Andr. Fred. Høst & Søn, Bredgade, Copenhagen, Denmark, April 1956. Among the articles presented in this journal are the following: "The Determination and Occurrence of Nickel in Sea Water, Marine Organisms, and Sediments," by Taivo Laevastu and Thomas G. Thompson; "Time and Duration of the Spawning Season in Some Marine Teleosts in Relation to Their Distribution," by S. Z. Qasim; "Chemical Composition of the Zones in Cod Otoliths," by Eva Henly Danevig; "The 'Critical Period' in the Early Life History of Marine Fishes," by John C. Marr; and "Some Experiments on Factors Influencing Mesh Selection in Trawls," by L. K. Boerema.

"The Lipids of Fish. 8. The Triglycerides and Cholesterol Esters of Haddock Flesh," by J. A. Lovern, article, The Biochemical Journal, vol. 63, no. 3, July 1956, pp. 373-380, illus., printed, 20 s. (US$3.25) net per issue. Cambridge University Press, American Branch, 32 East 57th St., New York 22, N. Y.

"Luring Fish with Pork," article, The Crown, vol. 45, no. 8, August 1956, pp. 14, 22, illus., printed. The Crown, P. O. Box 1837, Baltimore 3, Md. A brief description of the commercial preparation of pork-rind lures for bait casting, spinning, fly rods, and salt-water fishing. Long strips of pig back, with the hide intact, are treated in brine, cut to shape, and then sent to the freezer for more treatment. After the allotted time, they are removed from the freezer and are stamped, dyed, and bottled.

Marine Products in Japan, 30 pp., illus., printed. Ministry of Agriculture and Forestry, Tokyo, Japan, December 1955. This beautifully illustrated pamphlet discusses the position Japan's marine products occupy in its economy; canning marine products; whale oil industry; agar-agar and its uses; frozen fishery products; dry-salted marine products; and pearl culture. Also includes a list of the names and addresses of Japanese exporters of these products.

"Marking Experiment of the Young Herring (Clupea pallasi) in the Pacific Coast of Hokkaido, 1949-52," by H. Kondo and H. Kitahama, article, Bulletin of Hokkaido Regional Fisheries Research Laboratory, No. 9, November 1953, printed in Japanese. (Translated from Japanese by S. Tabata, Pacific Biological Station, Nanaimo, B.C., Canada.)

"Microbiological Assay of Vitamin B_{12} in Marine Solids," by Paul R. Burkholder and Lillian M. Burkholder, article, Science, vol. 123, no. 3207, June 15, 1956, pp. 1071-1073, illus., printed, single copy 25 cents. Science, 1515 Massachusetts Ave. NW., Washington 5, D. C.

"Microbiological Hazards of Precooked Frozen Foods," by R. P. Straka and J. L. Stokes, article, Quick Frozen Foods, February 1956, pp. 182-186, printed, single copy 50 cents. E. W. Williams Publications, Inc., 82 Wall St., New York 5, N. Y.

Migration of the Deep Sea Scallop (PECTEN MAGELLANICUS), by Frederick T. Baird, Jr., Fisheries Circular No. 14, 8 pp., illus., printed. Maine Department of Sea and Shore Fisheries, Vickery-Hill Bldg., Augusta, Me., January 1954.

"The New Fishery Act in Czechoslovakia," by J. Hanzal, article, Ceskoslovensky Rybar, vol. 7, no. 9, 1952, printed. (Translated from Czechoslovak and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B.C., Canada.)

A New Species of Sea Perch in the Barents Sea (SEBASTES MENTELLA TRAVIN, sp. nov.), by V. I. Travin, 5 pp., processed. (Translated from Russian by C. R. Robins, 1955.)

(Norway) Fiskeriene og Folkerettsreglene pa Havet (The Fisheries and International Law), by Olav Lund, Fiskeridirektoratets Smaskrifter Nr. 9 (Fishery Directorate Pamphlet No. 9), 19 pp., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

(Norway) Handsaming av Størje (Treatment of Tunafish), by Hans J. Fjørtoft, Fiskeridirektoratets Smaskrifter Nr. 5 (Fishery Directorate Pamphlet No. 5), 19 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

(Norway) Hvor Meget Blir der Fisket opp av Lofot-Skreien? (How Much Lofot Cod is Being Caught?), by Gunnar Dannevig, Fiskeridirektoratets Smaskrifter Nr. 10 (Fishery Directorate Pamphlet No. 10), 18 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Hvordan Utnytter vi Vare Torskeforekomster? (How Do We Utilize Our Cod Occurrences?), by Gunnar Saetersdal, Fiskeridirektoratets Smaskrifter Nr. 3 (Fishery Directorate Pamphlet No. 3), 10 pp., illus., printed. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

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(Norway) Internasjonale Fiskeriavtaler som Norge er Med i (International Fishery Conventions to which Norway is a Party), Fiskeridirektoratets Smaskrifter Nr. 5 (Fishery Directorate Pamphlet No. 5), 50 pp., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Lagring av Levende Fisk i Kummer pa Land (Storage of Live Fish in Basins on Land), by Gunnar Sundnes, Fiskeridirektoratets Smaskrifter Nr. 8 (Fishery Directorate Pamphlet No. 8), 6 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Lofotfiskets Lønnsomhet 1953 (Profitability of Lofot Fishery 1953), by Kare Ruud, Fiskeridirektoratets Smaskrifter Nr. 7 (Fishery Directorate Pamphlet No. 7), 23 pp., printed in Norwegian. (Reprinted from Fiskets Gang, no . 42, 1953.) A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Maskeviddeforsøk med Tral i 1954 (Mesh Width Experiments with Trawl in 1954), by Gunnar Saetersdal, Fiskeridirektoratets Smaskrifter Nr. 4 (Fishery Directorate Pamphlet No. 4), 11 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

(Norway) Merkeforsok som Viser Skreiens Oppførsel i Lofoten (Marking Experiments Showing the Behavior of the Cod in Lofoten), by Gunnar Dannevig, Fiskeridirektoratets Smaskrifter Nr. 2 (Fishery Directorate Pamphlet No. 2), 27 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

(Norway) Plan for Statens Fiskarfagskoler (Prospectus for State Fishery School), Fiskeridirektoratets Smaskrifter Nr. 3 (Fishery Directorate Pamphlet No. 3), 20 pp., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Plan for Statens Fiskarfagskular (Prospectus for State Fishery Schools), Fiskeridirektorates Smaskrifter Nr. 6 (Fishery Directorate Pamphlet No. 6), 20 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

(Norway) Plan for Statens Fiskarfagskoler (Prospectus for State Fishery Schools), Fiskeridirektoratets Smaskrifter Nr. 8 (Fishery Directorate Pamphlet No. 8), 20 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

(Norway) Radiotelefoni pa Fiskeflaten (Radiotelephone on the Fishing Fleet), Fiskeridirektoratets Smaskrifter Nr. 11 (Fishery Directorate Pamphlet No. 11), 4 pp., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Rapport over Tokter for Sildeundersøkelser med "G. O. Sars" Vinteren 1953-54 (Report on Expeditions on Herring Research with "G.O. Sars" in the Winter 1953-54), by Finn Devold, Fiskeridirektoratets Smaskrifter Nr. 4 (Fishery Directorate Pamphlet No. 4), 20 pp., illus., printed in Norwegian. (Reprinted from Fiskets Gang, nos. 21 and 22, 1954.) A/S John Griegs Boktrykkeri, Bergen, Norway, 1954.

(Norway) 1. Register (Register of Canning Factories and Joint Stock Companies--Export Companies--Selling Canned Fish Products); 2. Reglement (Rules of January 22, 1932, for Marking of Canned Fish Products); 3. Generelle Krav (General Requirements for Canning Factories Desiring to be Included in the Fishery Directorate Register), Fiskeridirektoratets Smaskrifter Nr. 2 (Fishery Directorate Pamphlet No. 2), 29 pp., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Tokter Med "G. O. Sars" i Norskehavet Vinteren 1952/53 (Expeditions with "G. O. Sars" in the Norwegian Sea-Winter 1952/53), by by Finn Devold, Fiskeridirektoratets Smaskrifter Nr. 6 (Fishery Directorate Pamphlet no. 6), 19 pp., illus., printed in Norwegian. (Reprinted from Fiskets Gang, no. 19, 1953.) A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Tralfisket etter Sild i Nordsjøen (Trawling for Herring in the North Sea. Some Operating Results for the Years 1949, 1950, 1951, and 1952), by Kare Ruud, Fiskeridirektoratets Smaskrifter Nr. 4 (Fishery Directorate Pamphlet No. 4), 12 pp., printed in Norwegian. (Reprinted from Fiskets Gang, no. 17, 1953.) A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Tran i den Morke Arstiden (Cod Liver Oil in the Winter), by Karl Evang, Fiskeridirektoratets Smaskrifter Nr. 1 (Fishery Directorate Pamphlet No. 1), 6 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1955.

(Norway) Vintersildfiskets Lonnsomhet 1953 (Profitability of Winter Herring Fishery 1953), by Arthur Holm, Fiskeridirektoratets Smaskrifter Nr. 9 (Fishery Directorate Pamphlet No. 9), 33 pp., illus., printed in Norwegian. (Reprinted from Fiskets Gang, no. 43, 1953.) A/S John Griegs Boktrykkeri, Bergen, Norway, 1953.

(Norway) Vintersildfiskets Lønnsomhet 1954 (Profitability of the Winter Herring Fishery 1954), by Kare Ruud, Fiskeridirektoratets Smaskrifter Nr. 6 (Fishery Directorate Pamphlet No. 6), 15 pp., printed in Norwegian. (Reprinted from Fiskets Gang, no. 43, 1954.) A/S John Griegs Boktrykkeri, Bergen, Norway, 1954.

"On the Biology of Reproduction of the White Sea Wolf-Fish (Anarhichas lupus L.)," by V. V. Barsukov, article, Zoologicheskii Zhurnal, vol. 32, no. 6, 1953, pp. 1211-1216, printed

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in Russian. (Preliminary translation by W. E. Ricker, Fisheries Research Board of Canada; distributed from the Newfoundland Fisheries Research Station, St. John's, Newfoundland.)

"Preliminary Note on the Peculiarity of Sardinella aurita of the Brazilian Coast," by W. Besnard, article, Boletin Instituto Paulista, vol.,1, no. 1, 1950, pp. 69-80, printed in Portuguese. (Translated from Portuguese and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"Populations and Migrations of the Sardine (Clupea pilchardus Walb) on the Portuguese Coast," by M. Ruivo, article, Boletin da Sociedade Portuguesea de Ciencias Naturais, pp. 89-121, 1950, printed in Portuguese and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"The Present Views and Limitations of Fish Traces Obtained in Echo-Sounding," by F. Schuler, article, Fischereiwelt, vol. 3, no. 7, July 1951, pp. 110-112, printed in German. (Translated from the German by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C.)

"Productivity of Fishing Waters and Fluctuations in the Abundance of Stocks of Commercial Fishes," by E. A. Bervald, article Zoologicheskii Zhurnal, vol. 31, no. 1, 1952, pp. 82-91, printed in Russian. (Abstract translated from Russian by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C.)

Quarterly Report on Fisheries Research, June 1956, No. 56-19, 12 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla.

"Queen of the Muddy Waters," article, Georgia Game and Fish, vol. 5, no. 10, Spring Edition, pp. 8-9, 21, illus., printed. Georgia Game and Fish Commission, 412 State Capitol, Atlanta, Ga. A brief description of the carp which can be found in nearly every state in the United States. Muddy, luke-warm streams in Georgia make ideal feeding grounds and spawning grounds for these fish.

Rail Freight Rates and the Fish and Sea Food Industry, 37 pp., processed. Freight Rate Service Branch, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., revised July 1956. A study of the current rail transportation rates on fish, shellfish, and other fishery products for purposes of analysis and comparison, and includes a comparison with rates on other food products. The rates and charges shown in this study are those prevailing on March 7, 1956.

Rapport Annuel sur l'Evolution de la Flotte de Peche en 1955 ("Annual Report on the Development of the Fishing Fleet in 1955"), 41 pp., processed in French. Ministere des Communications, Brussels, Belgium. Presents detailed statistics on the Belgian fishing fleet.

Rapports et Proces-Verbaux des Reunions (Reports and Verbal Proceedings of Meetings), vol. 141, 113 pp., printed in French and English, Kr. 18 (US$2.60). Conseil Permanent International pour L'Exploration de la Mer (International Council for Exploration of the Sea), Charlottenlund Slot, Denmark, June 1956. This report is divided into two parts: Part I--Proces-Verbaux, Novembre-Octobre 1955 (Verbal Proceedings, November-October 1955); and Part II--Rapport Administratif, 1954 (Administrative Report, 1954). Part I contains a report of the forty-third meeting of the International Council for the Exploration of the Sea at Copenhagen, October 24-November 1, 1955; approved budget for the financial year, 1955-1956, resolutions passed by the 43rd Statutory Meeting, 1955; list of members of committees; experts engaged in fisheries research in the Council's area; report and recommendations of the Consultative Committee; and reports and programs of the various committees. Part II contains an administrative report for the year ending October 31, 1955; and area and other committee reports on scientific research.

"Recorded and Visual Indications in Echo-Sounding for Fish in Proximity of the Bottom," by J. Scharfe, article, Die Fishwirtschaft, no. 3, 1953, printed in German. (Translated from German by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"The Relationship Between Fish-Length and Scale-Length in the Pilchard (Sardina pilchardus Wal.) in the Area of Castellon," by J. Rodriguez-Roda, M. G. Larraneta, and M. Duran, Publications del Instituto de Biologia Aplicada, Barcelona, X, pp. 53-65, 1952, printed in Spanish. (Translated from Spanish and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

Report on the Fisheries Industries of Fiji, by H. van Pel, Council Paper No. 1, 11 pp., illus., printed. South Pacific Commission, Noumea, New Caledonia. Describes a brief survey of the fishery resources of Fiji and the existing fishing methods and extent of their utilization. Past surveys and experiments are discussed; an assessment of the problems existing in the fisheries is made; and recommendations for the development of the marine and inland fisheries are given. Various ways of increasing the fish supply of Fiji, both by larger fish catches and by fish culture, have been indicated. "From the point of view of fisheries prospects," states the author, "Fiji is one of the most favoured territories in the South Pacific. There need never be a shortage of fish in this Colony."

Report of the International Technical Conference on the Conservation of the Living Resources of the Sea (18 April to 10 May 1955, Rome), A/Conf. 10/6, United Nations Publication Sales No.: 1955. II.B.2, 21 pp., printed, 25 cents. United Nations, New York, N. Y., 1955. (For sale by International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.)

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A Review of the Cephalopods of the Gulf of Mexico, by Gilbert L. Voss, Contribution No. 155, 93 pp., illus., printed. The Marine Laboratory, University of Miami, Coral Gables, Fla. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 6, no. 2, June 1956, pp. 85-178.) Three hundred and three specimens of cephalopods are reported upon, mostly captured by the U. S. Fish and Wildlife Service vessel Oregon in the Gulf of Mexico from 1950 to 1956. Thirty-five genera and 42 species are described and illustrated, of which 1 genus and 4 species are described as new.

Sea Moss (CHONDRUS CRISPUS), Survey, Washington County, by Walter S. Foster, General Bulletin No. 3, 12 pp., illus., printed. Department of Sea and Shore Fisheries, Augusta, Me., 1953.

Seaweeds at Ebb Tide, by Muriel Lewin Guberlet, 182 pp., illus., with drawings by Elizabeth L. Curtis, printed, $3.50. University of Washington Press, Seattle, Wash. Gives the names, habits, structures, and economic uses of the seaweeds found on the beach.

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Tarpon Cooperative Research Program, Progress Report, by Robert W. Ellis, No. 56-20, 13 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., July 1956.

"Territorial Waters and Related Matters," article, The Department of State Bulletin, vol. XXXIV, no. 869, Publication 6292, February 20, 1956, pp. 296-299, printed, single copy 20 cents. The Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.) A discussion of the action taken on the subject of territorial waters and related matters by the third meeting of the Inter-American Council of Jurists at Mexico City, January 17-February 4, 1956; the situation confronting the Council of Jurists; general debate; nine-country resolution; United States declaration and reservation; and the Cuban proposal.

Tide Tables, East Coast, North and South America (including Greenland), for the Year 1957, Serial No. 789, 277 pp., illus., printed, 50 cents. Coast and Geodetic Survey, U. S. Department of Commerce, Washington 25, D. C.

Tide Tables: West Coast, North and South America (including the Hawaiian Islands), for the Year 1957, Serial No. 791, 227 pp., illus., printed, 50 cents. Coast and Geodetic Survey, U. S. Department of Commerce, Washington 25, D. C.

"Tilapia--The Brooding Father," by Lester R. Aronson, article, Natural History, vol. LXV, no. 3, March 1956, pp. 146-151, illus., printed, single copy 50 cents. American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y. The name Tilapia is not applied to a single kind of fish but rather to a group of related African species which now number almost a hundred. This is an interesting article about the unusual spawning habits of the Tilapia macrocephala (also called T. heudeloti). This species of Tilapia is the predominant fish of the group along the coast of West Africa from Senegal south to Gabon. While it does not grow as large as some of the others and is therefore of less interest to fishery workers, it does form a staple in the diet in many coastal villages.

Trust Territory of the Pacific Islands, 1955, Department of State Publication 6243, International Organization and Conference Series III, 111; 210 pp., illus., printed, 70 cents. Department of State, Washington, D. C., April 16, 1956. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.) This report, covering fiscal year 1955, is the eighth annual report by the United States to the United Nations, pursuant to article 88 of the United Nations Charter, on the administration of the Trust Territory of the Pacific Islands. Some data on fisheries are included.

"Two Weeks in Father's Mouth," by Evelyn Shaw, article, Natural History, vol. LXV, no. 3,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

March 1956, pp. 152-153, illus., printed, single copy 50 cents. American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y. A brief description with accompanying photographs of the changes that occur in Tilapia eggs during the two weeks the embryos spend in the mouth of the male.

"Under-Water Observation of Fishing Gear by Means of an Immersion (Plunge) Kettle," by Ulrich Bodo, article, Fischerewelt, vol. 4, no. 2, February 1952, printed in German. (Translated from German and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

United States Government Organization Manual, 1956-57, 792 pp., printed, $1. Federal Register Division, National Archives and Records Service, General Services Administration, Washington, D. C., 1956. (For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

"The Use of Echo-Sounders in Drift-Fisheries," Schuler and G. Kreft, article, Fischereiwelt, vol. 3, no. 4, April 1951, pp. 63-65, printed in German. (Translated from German and summarized by Dr. G. Mares, Pacific Biological Station, Nanaimo, B. C., Canada.)

"Volatile Reducing Substances (VRS) and Volatile Nitrogen Compounds in Relation to Spoilage in Canned Fish," by Lionel Farber and Michael Ferro, article, Food Technology (Published by the Institute of Food Technologists), vol. 10, no. 7, July 1956, pp. 303-304, illus., printed, single copies of periodical: domestic US$1.50, foreign US$1.75. The Garrard Press, 119 West Park Ave., Champaign, Ill. Describes a study in which cans of fish were examined for their content of total volatile (TVN) and trimethylamine nitrogen (TMN) so that these could be compared with that of volatile-reducing substances (VRS). In this report are presented some representative data on the content of these substances in a number of species of fish, canned and varying in freshness or acceptability as human food, as judged organoleptically. The content of volatile-reducing substances (VRS), total volatile and trimethylamine nitrogen (TVN, TMN) in canned California anchovies, California and Atlantic herring, California mackerel, California sardines in brine and in tomato sauce and tuna was determined for material judged organoleptically to be passable and not passable. The content of VRS correlated quite closely with the organoleptic judgment, whereas the content of TVN and TMN did not show any definite correlation. The content of trimethylamine nitrogen apparently varies with the species of fish canned and is the same in fish of different states of freshness for any single species.

Whaling--Amendments to the Schedule to the International Whaling Convention Signed at Washington on December 2, 1946, Treaties and Other International Acts Series 3198, Department of State Publication 5899, 11 pp., printed, 10 cents. Department of State, Washington, D.C., 1956. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents the amendments adopted at the Sixth Meeting of the International Whaling Commission, Tokyo, Japan, July 19-23, 1954, and which entered into force November 8, 1954, and February 17 and 24, 1955.

SPECIES OF FISH FIRST USED IN THE HOT-FISH SHOPS OF THE MIDDLE WEST

In the early days of fish-frying operations, the local species such as catfish, buffalofish, perch, sunfish, and blue pike were used. One enterprising wholesale fish firm in St. Louis introduced the whiting to this trade in the 1920's and its acceptance was comparatively rapid. At the time the annual production of whiting from the Northeastern States was about 17 million pounds. Much of this was frozen near fishing centers and shipped to the St. Louis market by the carload. As late as 1932 it was considered remarkable that the ambition and industry of a few individuals could make possible the distribution of more than one-fourth of the supply of this fish in a single city, some 600 or 700 miles from the source of supply.

--Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.

CONTENTS (CONTINUED)

Page

TRENDS AND DEVELOPMENTS (Contd.)
- South Carolina:
  - Oyster Laws Revised 34
- Tuna:
  - Albacore Being Sought off Oregon-Washington Coast 34
- United States Fishing Fleet Additions 35
- U. S. Foreign Trade:
  - Edible Fishery Products, May-June 1956 36
  - Groundfish Fillet Imports Drop 6 Percent in August 37
  - Imports and Exports of Selected Fishery Products, January-June 1956 37
- Wholesale Prices, August 1956. 38

FOREIGN: 41
- International:
  - U. N. International Law Commission:
    - Conference on Law of the Sea Proposed 41
  - Food and Agriculture Organization:
    - Edible Fish Meals 42
  - International Congress on Canned Foods 44
  - (Northern European) International Fisheries Convention:
    - Fifth Meeting of Permanent Commission 44
  - Mediterranean Fisheries Council:
    - Proposes Investigation of Mediterranean Fish Migrations 45
  - Whaling:
    - International Whaling Commission Eighth Annual Meeting 46
- Algeria:
  - Canned Sardine Market 47
- Australia:
  - Act Setting Up Fund to Develop Fisheries Passed 49
  - Canned Sardine Market 49
  - Cultured Pearl Farm 51
  - New Department of Agriculture, Fisheries, and Whaling Established 52
  - Shrimp Exports to United States 52
  - Western Australia Shrimp Survey 53
  - "White" Spiny Lobster Seen as Moulted Adolescent 55
- Austria:
  - Canned Sardine Market 56
- Belgian Congo:
  - Canned Sardine Market 58
- Burma:
  - Canned Sardine Market 58
- Canada:
  - Aureomycin Use on Fish Accepted by Authorities . 59
  - Fresh Silver Salmon Exports Prohibited After August 31 59
  - Pearl Essence Produced on West Coast 60
- Denmark:
  - Fish Consumption Down 60
  - Lift-up Wheelhouse for Seiners 60
- Ecuador:
  - Regulations Affecting Fisheries 60
- Egypt:
  - Canned Sardine Market..... 61
- Formosa:
  - Canned Sardine Market..... 62
- France:
  - Fish Canning Industry and Canned Sardine Market..... 63

Page

FOREIGN (Contd.)
- France (Contd.):
  - Review of the Fisheries, 1955 68
- French West Africa:
  - Canned Sardine Market..... 68
  - Albacore Tuna Fishing 69
- German Federal Republic:
  - Inauguration of 1956 Deep-Sea Fishing Season .. 69
- Gold Coast:
  - Canned Sardine Market 70
- Iceland:
  - Fisheries Trends, January-July 1956 70
  - Large Number of Filleting and Skinning Machines Purchased 71
  - New Trawlers Ordered From West German Shipyard 71
  - North Coast Herring Season 71
  - Review of the Fisheries, 1955 72
  - Winter Fishing Season, 1956 72
- India:
  - Dried Shrimp Industry Facing Crisis 73
  - First Freezer Vessel to Handle Shrimp 73
  - New Fish Freezing Plant Proposed 74
- Japan:
  - Canned Salmon Pack and Sales Plan for 1956 ... 74
  - North Pacific High Seas Salmon Fishing Developments..... 74
  - Costs of Joint United States-Japanese Canned Tuna Advertising Studied 75
  - Canned Tuna Exports to United States..... 76
  - Measures Taken for Orderly Marketing of Canned Tuna to United States 76
  - Tuna Fisheries Research Council Established .. 77
  - Tuna Vessels to Fish in African Waters 77
  - Fishery Products Lead in Food Products Exported to United States in 1955..... 77
  - Marine Fishing Fleet..... 78
  - Number and Type of Operators in the Marine Fisheries 78
- Republic of Korea:
  - Fishery Firm Buys Trawlers Imported by UNKRA . 79
- Liberia:
  - Import Duties on Fishery Products Lowered ... 80
- Luxembourg:
  - Canned Sardine Market..... 80
- Malaya:
  - Development of Sea Fisheries Under Way 81
  - Japanese Firm Studies Possibilities of Pearl Culture 81
- Mexico:
  - Japanese-Mexican Fishing Company Plans Have Not Materialized Yet 82
  - West Coast Shrimp Season off to Good Start.... 82
- New Caledonia:
  - Tuna Resources Studied 82
- New Zealand:
  - Canned Sardine Market 83
- Norway:
  - Fisheries Trends, January-June 1956 84
  - Frozen Fish Exports 85
  - World's Longest Salmon Ladder 85
- Peru:
  - Fisheries Trends, August 1956 85
- Republic of the Philippines:
  - Canned Sardine Market 85

Contents Continued Page 121

CONTENTS (CONTINUED)

FOREIGN (Contd.): Page

Portugal:
- Number of New Fishing Vessels to Operate at Each Fishing Port to be Regulated 86
- Fisheries Trends, May 1956 87
- Canned Fish Pack, January-March 1956 87
- Canned Fish Exports, January-May 1956 88

Spain:
- Fisheries Trends, July 1956 88

Switzerland:
- Canned Sardine Market 89

Union of South Africa:
- Canned Sardine Market 90
- Controlled Fish Meal Price Increased 91
- Fisheries Trends, July 1956 91

Union of South Africa - South-West Africa:
- Fishing and Processing Levy to Finance Pilchard Research 92

U. S. S. R.:
- Larger Fishing Fleet Operating Near Faroe Islands 92
- Report on Fishery Research by Norwegian Scientist 92

United Kingdom:
- Commercial Test for Aureomycin-Stored Fish.. 93
- Fishing Industry Subsidies and Grants Changed . 94
- Fish Meal Growing in Importance 95
- Large All-Welded Trawler Built 96
- Research on Handling and Preserving Fish 98

FOREIGN (Contd.): Page

Venezuela:
- Fish Canners Want Marketing Monopoly 99
- Manufacture of Fish Meal From Whole Fish Prohibited 99
- Territorial Waters, Continental Shelf, and Fisheries Law 99

Vietnam:
- Canned Sardine Market 100
- Japan-Vietnam Commercial Fishing Agreement Inaugurates Deep-Sea Fishing 101

Yugoslavia:
- New Fish Canneries and Meal Plants 102

FEDERAL ACTIONS: 103
- Federal Trade Commission:
  - Price Fixing on King Crabs in Alaska Charged.. 103

FISHERY INDICATORS: 105
- Chart 1 - Fishery Landings for Selected States .. 105
- Chart 2 - Landings for Selected Fisheries 106
- Chart 3 - Cold Storage Holdings and Freezings of Fishery Products 107
- Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers... 108
- Chart 5 - Fish Meal and Oil Production - U. S. and Alaska 108
- Chart 6 - Canned Packs of Selected Fishery Products 109
- Chart 7 - U. S. Fishery Products Imports 110

RECENT FISHERY PUBLICATIONS: 111
- Fish and Wildlife Service Publications 111
- Miscellaneous Publications 112

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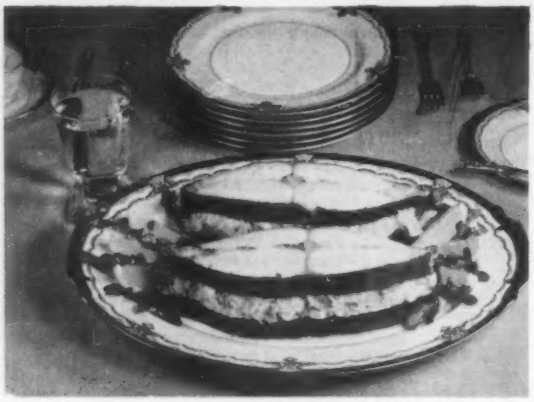
"HOW TO COOK HALIBUT"

How to Cook Halibut, the ninth in a series of cookbooks called the "Test Kitchen Series," has just come off the press and is now available to the public. This publication contains 27 recipes developed and kitchen-tested by the U. S. Fish and Wildlife Service home economists. It contains recipes for cocktails, soups, salads, sandwiches, and a wide variety of main dishes along with well-illustrated pictures of four of these recipes. It also contains pertinent information about halibut which will be of general interest to the consumer.



Halibut Hawaiian

Halibut is a firm and flavorful fish with white translucent meat. Steaks are the most common retail form in which halibut is marketed. Even though the greatest proportion of halibut comes from the Pacific Northwest, halibut is available in all parts of the United States as frozen steaks.

Fish dealers, as well as homemakers and food editors, will find many valuable uses for this recipe booklet. Many dealers can increase their halibut sales by giving this booklet to their customers. Dealers can also reprint any of these recipes, although a credit line is appreciated.

How to Cook Halibut, published by the U. S. Fish and Wildlife Service, may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 20 cents a copy. A 25-percent discount is given on orders of 100 or more copies sent to one address.

The other cookbooks in this series are:

Fish Cookery for One Hundred, by Rose G. Kerr. Test Kitchen Series No. 1. Price 30 cents.

Basic Fish Cookery, by Rose G. Kerr. Test Kitchen Series No. 2. Price 20 cents.

How to Cook Oysters, by Rose G. Kerr and Jean Burtis. Test Kitchen Series No. 3. Price 10 cents.

How to Cook Salmon, by Kathryn L. Osterhaug and Rose G. Kerr. Test Kitchen Series No. 4. Price 15 cents.

How to Cook Ocean Perch, by Dorothy M. Robey and Rose G. Kerr. Test Kitchen Series No. 6. Price 10 cents.

How to Cook Shrimp, by Jean Burtis and Rose G. Kerr. Test Kitchen Series No. 7. Price 15 cents.

How to Cook Clams, by Kathryn L. Osterhaug and Rose G. Kerr. Test Kitchen Series No. 8. Price 20 cents.

HOW TO COOK

HALIBUT

Test Kitchen Series No. 9
Fish and Wildlife Service
United States Department of the Interior